

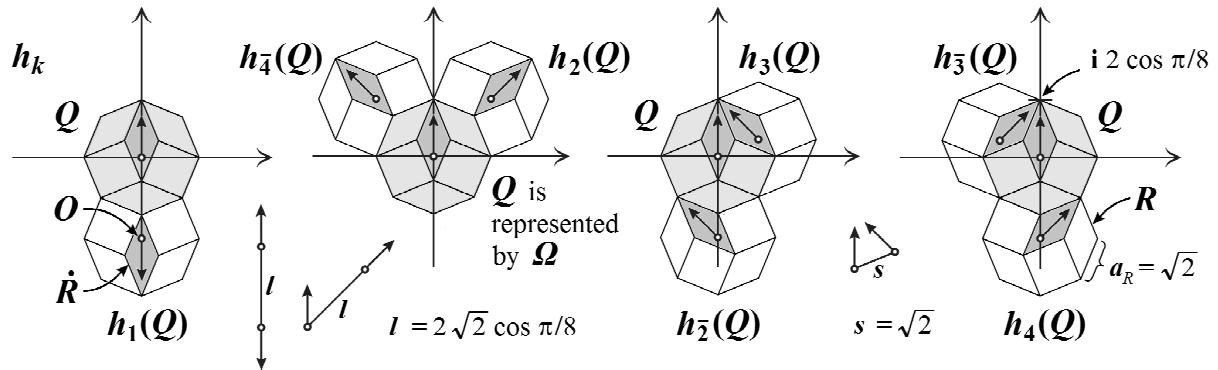
## Pfadberechnung mit der Oktogonalen Quasiperiodischen Sukzession

Am Beispiel einer Pfadberechnung wird hier der *Rekursive Algorithmus der Oktogonalen Quasiperiodischen Sukzession* vorgestellt [1][2]. Beginnend mit einer Startzelle  $Q_0$  kann damit schrittweise ein fehlerfreies *Ammann-Beenker-Parkett* berechnet werden.

Die sieben Transformationen  $h_k$  orientieren sich an dekagonalen Vorbildern [3]. Eine zu  $h$  inverse Transformation  $h^{-1}$  wird mit einem Minuszeichen über dem Index  $k$  versehen.

Die Quasizellen  $Q$  sind wegen ihrer gitterartigen Zellgeometrie [1] und den korrelierenden Doppelskalen für eine übersichtliche Darstellung von Überdeckungen nur bedingt geeignet.

Da die Quasizellen  $Q$  eine Äquivalenzbeziehung zu den geometrisch einfacheren Gähler-Oktogonalen  $\Omega$  besitzen [4], werden sie in den Grafiken durch diese repräsentiert.



Figur 1. Die sieben Transformationen  $h_k$  einer Quasizelle  $Q$  sind hier als Überdeckungen von Gähler-Oktogonalen  $\Omega$  dargestellt. Die Gähler-Oktogone besitzen eine Äquivalenzbeziehung zu den nicht abgebildeten Quasizellen  $Q$  (siehe auch Poster bzw. Abstract) und zu ihren zentralen Rhomben  $\tilde{R}$ , in denen die orientierten Mittelpunkte  $O$  von  $\Omega$  bzw.  $Q$  enthalten sind.

Die in Figur 1 angegebene Kantenlänge  $a_R = \sqrt{2}$  der Rhomben  $R$  skaliert die Geometrie in Übereinstimmung mit der normierten Länge 1 der Doppelskalen  $a$  und  $d$  der Quasizellen  $Q$ .

Mit dieser Skalierung ergeben sich für die beiden Mittelpunktverschiebungslängen  $l$  und  $s$  der sieben Transformationen  $h_k \in \{h_2, h_3, h_4, h_1, h_2, h_3, h_4\}$  die folgenden Werte:

$$l = 2\sqrt{2} \cos \pi/8 \quad \text{für } h_1, h_2, h_2, h_4, h_4 \quad \text{und} \quad s = \sqrt{2} \quad \text{für } h_3 \text{ und } h_3$$

Mit  $l, s, i^2 = -1, z \in \mathbb{C}$  und  $E^2 \rightarrow E^2$  können die Transformationen  $h_k$  angegeben werden:

$$h_1(z) = z \cdot (-1) + l \cdot (-i)$$

$$h_2(z) = z \cdot (0,5\sqrt{2} - i 0,5\sqrt{2}) + l \cdot (0,5\sqrt{2} + i 0,5\sqrt{2})$$

$$h_2(z) = z \cdot (0,5\sqrt{2} + i 0,5\sqrt{2}) + l \cdot (-i)$$

$$h_3(z) = z \cdot (0,5\sqrt{2} + i 0,5\sqrt{2}) + s \cdot (\cos \pi/8 + i \sin \pi/8)$$

$$h_3(z) = z \cdot (0,5\sqrt{2} - i 0,5\sqrt{2}) + s \cdot (-\cos \pi/8 + i \sin \pi/8)$$

$$h_4(z) = z \cdot (0,5\sqrt{2} - i 0,5\sqrt{2}) + l \cdot (-i)$$

$$h_4(z) = z \cdot (0,5\sqrt{2} + i 0,5\sqrt{2}) + l \cdot (-0,5\sqrt{2} + i 0,5\sqrt{2})$$

Eine Transformation, d.h. eine Nachfolgezelle  $h_k(Q)$  einer Zelle  $Q$ , wird nur dann von der rekursiven Formel zugelassen, wenn alle vier Skalenwerte  $a, b, c, d$  der Nachfolgezelle Werte aus den entsprechenden Wertemengen  $\{a_k^{\text{def}}\}, \{b_k^{\text{def}}\}, \{c_k^{\text{def}}\}, \{d_k^{\text{def}}\}$  sind und damit einen Wahrheitswert  $t = T$  besitzen. Nur in diesem Fall bekommt die Zelle  $h_k(Q)$  ebenfalls einen Wahrheitswert  $t_k = T$ . Das Wahrheitsfeld wird dann zur Verdeutlichung blau markiert.

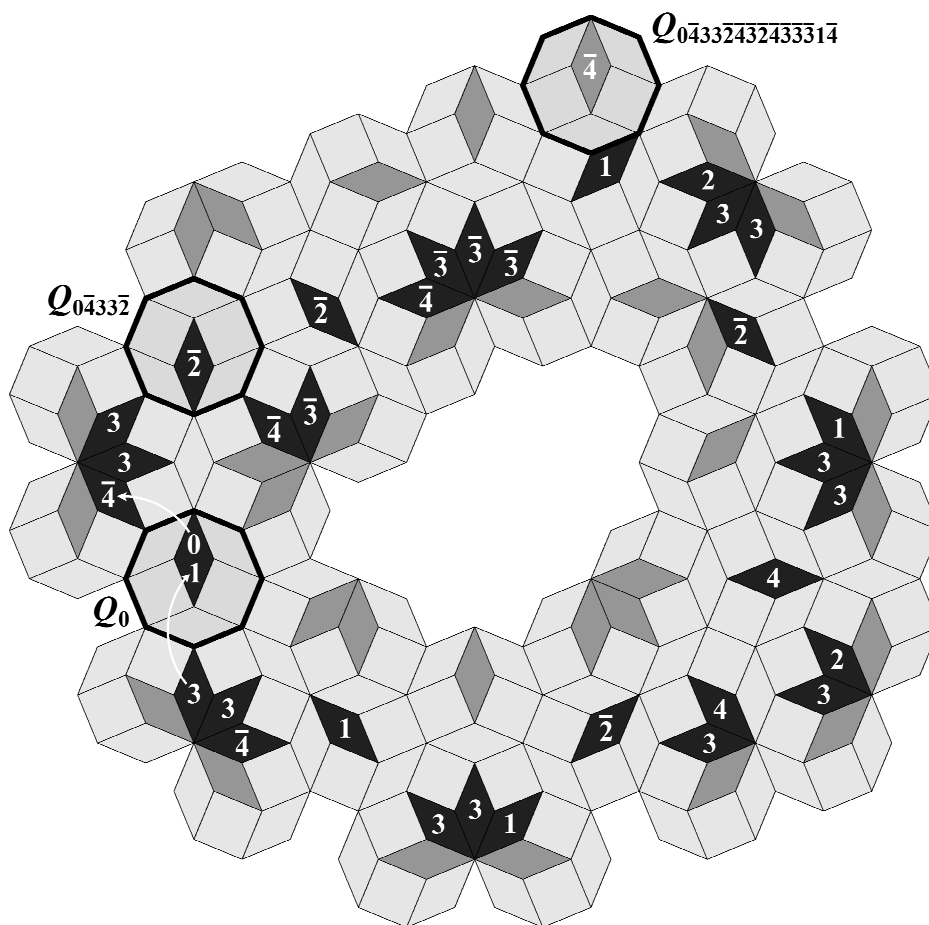
Alle durch einen Wahrheitswert  $t_k = \mathbf{T}$  verifizierten Quasizellen  $h_k(Q)$  besitzen verifizierte Vorgängerzellen  $Q_0 \dots v$ , deren verifizierter Pfad bis zur Startzelle  $Q_0$  zurückreicht.

Zellen mit einem Wahrheitswert  $t_k = \mathbf{T}$  dürfen in Folgerechnungen als Vorgängerzellen eingesetzt werden, wobei der Index  $k$  zum Index  $v$  (verified) umbezeichnet wird.

Mit  $Q_0 \dots vk$  werden die sieben potentiellen Nachfolgezellen von  $Q_0 \dots v$  bezeichnet, von denen immer drei durch die Formel verifiziert und vier durch ein  $t_k = \mathbf{F}$  falsifiziert werden.

Eine der drei verifizierten Zellen  $Q_0 \dots vk$  ist immer schon als Vorvorgängerzelle berechnet worden. Bei einer Pfadberechnung wird nur für eine der beiden anderen Zellen eine Folgerechnung erstellt. Die Kopfzeile dieses Formelblocks wird blau markiert. Im nächsten Formelsatz wird dieser Block als Vorgängerzelle  $Q_0 \dots v$  separat an oberster Stelle placiert.

In der Pfadschreibweise einer Quasizelle  $Q$  werden die Indizes  $v$  aller Transformationen  $h_v$  ab der Startzelle  $Q_0$  im Pfadindex der Quasizelle aneinandergereiht (z.B.:  $Q_{0\bar{4}33\bar{2}}$ ).



Figur 2. Der mit der Sukzessionsformel berechnete Pfad  $P$ , dargestellt als Überdeckung von Gähler-Oktogonen  $\Omega$ . Die Überdeckung erzeugt ein perfektes Ammann-Beenker-Parkett.

In Figur 2 werden die zur Folgeberechnung ausgewählten Zellen  $Q_0 \dots vk$  durch schwarze Rhomben  $\hat{R}$  repräsentiert (vgl. Fig. 1) und mit ihrer Index-Endziffer bezeichnet (z.B.  $Q_{0\bar{4}33\bar{2}}$  mit  $\bar{2}$ ). Für die grauen Rhomben  $\hat{R}$  wurde keine Folgerechnung durchgeführt.

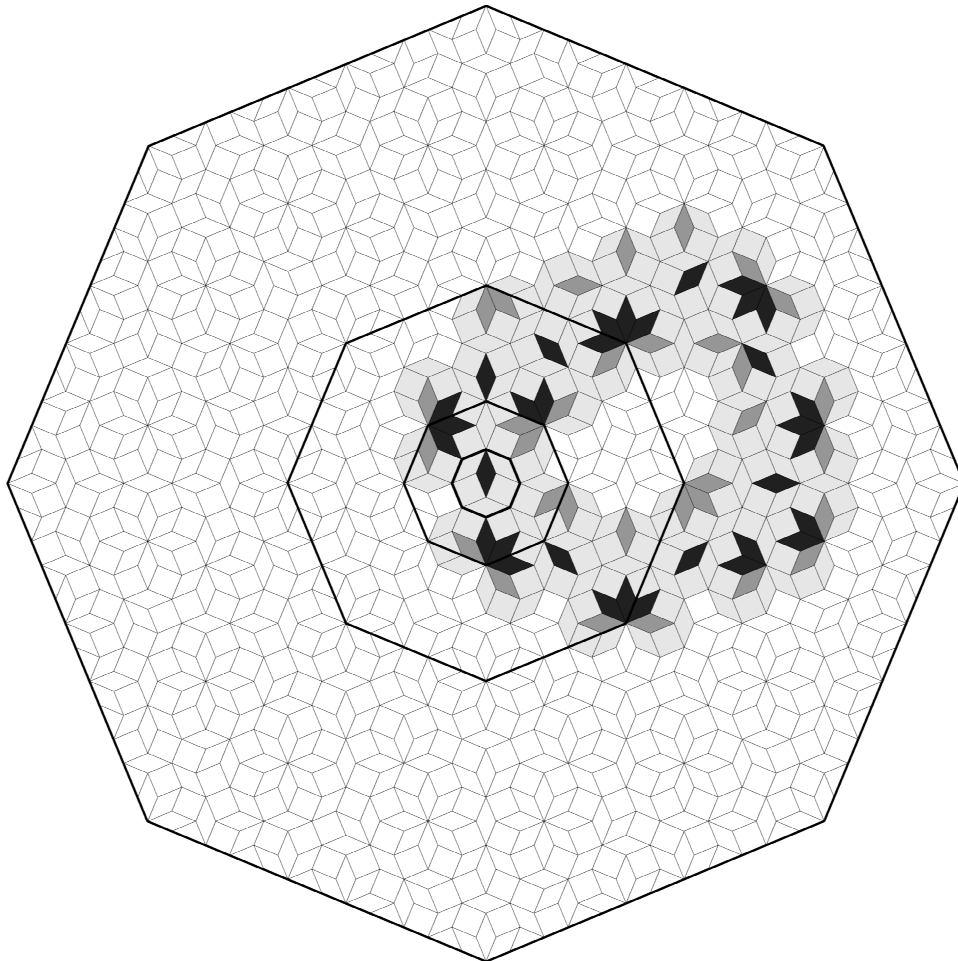
Der Pfad  $P$  wird von der Startzelle  $Q_0$  aus zunächst nach oben bis nach  $Q_{0\bar{4}33\bar{2}}$  geführt und dann im Uhrzeigersinn um die weiße Insel in der Mitte herum nach  $Q_0$  zurück.

Trotz dieser ausladenden Pfadföhrung kann man zeigen, dass die Startzelle  $Q_0$  von der Quasizelle  $Q_{0\bar{4}33\bar{2}43243331233\bar{2}13342343\bar{2}13314331}$  widerspruchsfrei überdeckt wird und dass sich für diese Zelle, auch nach über dreißig Berechnungen durch die rekursive Sukzessionsformel, die gleichen infinitesimalen Skalenwerte  $\mu_0$  ergeben, die in der Startzelle  $Q_0$  eingesetzt wurden.

Es ist eine fundamentale Eigenschaft der Quasiperiodischen Sukzession, dass zwei Zellen mit identischer Lage auch die gleichen *Skalenwerte* besitzen, unabhängig davon, auf welchem Weg sie berechnet worden sind. Diese Eigenschaft ist wichtig für ein fehlerfreies Wachstum, sie impliziert aber auch, dass mit der Formel eine *deterministische Struktur* erzeugt wird.

Dennoch ist die Quasiperiodische Sukzession eine *lokal gesteuerte Wachstumsregel*, da der *Strukturaufbau* immer nur von den Skalenwerten der Nachbarzellen bestimmt wird.

Diese *lokal* aufgebaute Struktur kann aber auch durch die *global* agierende *Substitution* konstruiert werden. Figur 3 zeigt ein Ammann-Beenker-Parkett  $\Omega^3$ , das durch dreimalige *deflationäre Substitution* der Bausteine eines gleich großen Gähler-Oktogons  $\Omega$  entsteht.



Figur 3. Übereinstimmung des Pfades  $P$  mit dem Parkett  $\Omega^3$ , das durch dreimalige Substitution eines Gähler-Oktogons  $\Omega$  erzeugt wurde. Die Startzelle  $Q_0$  ( $\Omega^0$ ) befindet sich genau im Zentrum.

Nach *gegen unendlich gehend vielen Iterationsschritten* gelangt man zu einem *fast unbegrenzt ausgedehnten Ammann-Beenker-Parkett*  $\Omega^{\lim \rightarrow \infty}$  mit einem *eindeutig definierten Gähler-Oktogon*  $\Omega^0$  im Zentrum. Wenn die Startzelle  $Q_0$  auf  $\Omega^0$  placiert wird, besitzt jede Zellstruktur, die mit der Oktogonalen Quasiperiodischen Sukzession berechnet wird, eine Äquivalenzbeziehung zum Ammann-Beenker Parkett  $\Omega^{\lim \rightarrow \infty}$ .

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Literaturhinweise: [1] Uli Gaenshirt and M. Willsch, Materials Structure **22**, no. **4** (2015), p. 299-300  
 [2] Uli Gaenshirt and Michael Willsch, Philos. Mag. **87** (2007), p. 3055-3065  
 [3] Petra Gummelt, Geometriae Dedicata **62** (1996), p. 1-17  
 [4] S. I. Ben Abraham and F. Gähler, Phys. Rev. B **60** (1999), p. 860-864

|               |         |                   |                             |                                           |   |              |
|---------------|---------|-------------------|-----------------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_0$   | <i>Start-cell</i> | <i>Verified predecessor</i> | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $\mu_0$ |                   |                             | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\mu_0$ |                   |                             | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\mu_0$ |                   |                             | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $\mu_0$ |                   |                             | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                                                      |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | <i>Forbidden successor of <math>Q_{0...v}</math></i> |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $\lambda^{-1} - \mu_0$                               | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $-\lambda^{-1} + \mu_0$                              | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             | $1 - \mu_0$                                          | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             | $1 - \mu_0$                                          | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |

|                                       |                                                      |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | <i>Forbidden successor of <math>Q_{0...v}</math></i> |                                        | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | F          | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $\sqrt{2} - \mu_0$                                   | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v3} = 1 - a_{0...v} =$        | $1 - \mu_0$                                          | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v3} = b_{0...v} =$            | $\mu_0$                                              | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = 1 - c_{0...v} =$        | $1 - \mu_0$                                          | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                        |                                                      |                                                        |                     |            |              |
|-------------------------------------------|------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | $Q_{04}$               | <i>verified</i>                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | T          | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $1 - \mu_0$            | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $\lambda^{-1} + \mu_0$ | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ | $\lambda^{-1} - \mu_0$ | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v4} = 1 - a_{0...v} =$            | $1 - \mu_0$            | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                        |                                       |                                                        |                     |            |              |
|-------------------------------------------|------------------------|---------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | $Q_{01}$               | <i>verified</i>                       | $\Leftarrow$                                           | $t_k(Q_{0...v1}) =$ | T          | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $1 - \mu_0$            | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $\lambda^{-1} - \mu_0$ | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $\lambda^{-1} - \mu_0$ | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v1} = 1 - d_{0...v} =$            | $1 - \mu_0$            | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                        |                                                      |                                                        |                     |            |              |
|-------------------------------------------|------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | $Q_{02}$               | <i>verified</i>                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | T          | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $1 - \mu_0$            | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ | $\lambda^{-1} - \mu_0$ | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ | $\lambda^{-1} + \mu_0$ | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v2} = 1 - c_{0...v} =$            | $1 - \mu_0$            | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                       |                                                      |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | <i>Forbidden successor of <math>Q_{0...v}</math></i> |                                        | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | F          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v} =$        | $1 - \mu_0$                                          | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v} =$            | $\mu_0$                                              | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v} =$        | $1 - \mu_0$                                          | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v} =$ | $\sqrt{2} - \mu_0$                                   | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |

|                                            |                                                      |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | <i>Forbidden successor of <math>Q_{0...v}</math></i> |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | F          | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $1 - \mu_0$                                          | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v4} = 1 - a_{0...v} =$             | $1 - \mu_0$                                          | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ | $-\lambda^{-1} + \mu_0$                              | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  | $\lambda^{-1} - \mu_0$                               | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                  |                        |                      |                                              |   |              |
|------------------|------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{0\bar{4}}$         | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $1 - \mu_0$            |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\lambda^{-1} + \mu_0$ |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\lambda^{-1} - \mu_0$ |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $1 - \mu_0$            |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                        |                                       |                                                              |                                                                         |                              |            |              |
|--------------------------------------------------------|---------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------|------------|--------------|
| $Q_{0\dots v\bar{2}} = h_{\bar{2}}(Q_{0\dots v})$      | Forbidden successor of $Q_{0\dots v}$ |                                                              | $\Leftarrow$                                                            | $t_k(Q_{0\dots v\bar{2}}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v\bar{2}} = \lambda^{-1} - b_{0\dots v} =$  | $-\mu_0$                              | $0 < a_{\bar{2}}^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v\bar{2}} \in \{a_{\bar{2}}^{\text{def}}\}) =$ | F                            | $\uparrow$ |              |
| $b_{0\dots v\bar{2}} = -\lambda^{-1} + c_{0\dots v} =$ |                                       | $0 < b_{\bar{2}}^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v\bar{2}} \in \{b_{\bar{2}}^{\text{def}}\}) =$ |                              | $\uparrow$ |              |
| $c_{0\dots v\bar{2}} = 1 - d_{0\dots v} =$             |                                       | $0 < c_{\bar{2}}^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v\bar{2}} \in \{c_{\bar{2}}^{\text{def}}\}) =$ |                              | $\uparrow$ |              |
| $d_{0\dots v\bar{2}} = 1 - a_{0\dots v} =$             |                                       | $0 < d_{\bar{2}}^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v\bar{2}} \in \{d_{\bar{2}}^{\text{def}}\}) =$ |                              | $\uparrow$ |              |

|                                                   |                                       |                                                |                                                                         |                              |            |              |
|---------------------------------------------------|---------------------------------------|------------------------------------------------|-------------------------------------------------------------------------|------------------------------|------------|--------------|
| $Q_{0\dots v\bar{3}} = h_{\bar{3}}(Q_{0\dots v})$ | $Q_{0\bar{4}\bar{3}}$                 | verified                                       | $\Leftarrow$                                                            | $t_k(Q_{0\dots v\bar{3}}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v\bar{3}} = \sqrt{2} - d_{0\dots v} =$ | $\lambda^{-1} + \mu_0$                | $\lambda^{-1} < a_{\bar{3}}^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v\bar{3}} \in \{a_{\bar{3}}^{\text{def}}\}) =$ | T                            | $\uparrow$ |              |
| $b_{0\dots v\bar{3}} = 1 - a_{0\dots v} =$        | $\mu_0$                               | $0 < b_{\bar{3}}^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v\bar{3}} \in \{b_{\bar{3}}^{\text{def}}\}) =$ | T                            | $\uparrow$ |              |
| $c_{0\dots v\bar{3}} = b_{0\dots v} =$            | $\lambda^{-1} + \mu_0$                | $0 < c_{\bar{3}}^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v\bar{3}} \in \{c_{\bar{3}}^{\text{def}}\}) =$ | T                            | $\uparrow$ |              |
| $d_{0\dots v\bar{3}} = 1 - c_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $\lambda^{-2} < d_{\bar{3}}^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v\bar{3}} \in \{d_{\bar{3}}^{\text{def}}\}) =$ | T                            | $\uparrow$ |              |

|                                                       |                                       |                                                              |                                                                         |                              |            |              |
|-------------------------------------------------------|---------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------|------------|--------------|
| $Q_{0\dots v\bar{4}} = h_{\bar{4}}(Q_{0\dots v})$     | Forbidden successor of $Q_{0\dots v}$ |                                                              | $\Leftarrow$                                                            | $t_k(Q_{0\dots v\bar{4}}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v\bar{4}} = 1 - b_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $\lambda^{-1} + \lambda^{-2} < a_{\bar{4}}^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v\bar{4}} \in \{a_{\bar{4}}^{\text{def}}\}) =$ | F                            | $\uparrow$ |              |
| $b_{0\dots v\bar{4}} = \lambda^{-1} + c_{0\dots v} =$ |                                       | $\lambda^{-1} < b_{\bar{4}}^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0\dots v\bar{4}} \in \{b_{\bar{4}}^{\text{def}}\}) =$ |                              | $\uparrow$ |              |
| $c_{0\dots v\bar{4}} = \lambda^{-1} - d_{0\dots v} =$ |                                       | $0 < c_{\bar{4}}^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v\bar{4}} \in \{c_{\bar{4}}^{\text{def}}\}) =$ |                              | $\uparrow$ |              |
| $d_{0\dots v\bar{4}} = 1 - a_{0\dots v} =$            |                                       | $\lambda^{-1} < d_{\bar{4}}^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v\bar{4}} \in \{d_{\bar{4}}^{\text{def}}\}) =$ |                              | $\uparrow$ |              |

|                                                 |                                       |                                       |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|---------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                       | $\Leftarrow$                                              | $t_k(Q_{0\dots v1}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $\mu_0$                               | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $-\mu_0$                              | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ |                                       | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            |                                       | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $\mu_0$                               | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ |                                       | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ |                                       | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            |                                       | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                       |                                                |                                                                   |                        |            |              |
|---------------------------------------------|---------------------------------------|------------------------------------------------|-------------------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{0\bar{4}\bar{3}}$                 | verified                                       | $\Leftarrow$                                                      | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $\lambda^{-2} < a_{\bar{3}}^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_{\bar{3}}^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $\lambda^{-1} - \mu_0$                | $0 < b_{\bar{3}}^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_{\bar{3}}^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $\mu_0$                               | $0 < c_{\bar{3}}^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_{\bar{3}}^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ | $\lambda^{-1} + \mu_0$                | $\lambda^{-1} < d_{\bar{3}}^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_{\bar{3}}^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                  |                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|-----------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | $Q_{0\bar{4}\bar{4}}$ | verified                                             | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $\mu_0$               | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             | $\mu_0$               | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ | $\mu_0$               | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  | $\mu_0$               | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|               |                                       |                      |                                           |   |              |
|---------------|---------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{0\bar{4}3}$                       | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$ |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-1} - \mu_0$                |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\mu_0$                               |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $\lambda^{-1} + \mu_0$                |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                  |                                    |                                                              |                                                                      |                           |            |              |
|--------------------------------------------------|------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------|---------------------------|------------|--------------|
| $Q_{0...v\bar{2}} = h_{\bar{2}}(Q_{0...v})$      | Forbidden successor of $Q_{0...v}$ |                                                              | $\Leftarrow$                                                         | $t_k(Q_{0...v\bar{2}}) =$ | F          | $\Leftarrow$ |
| $a_{0...v\bar{2}} = \lambda^{-1} - b_{0...v} =$  | $\mu_0$                            | $0 < a_{\bar{2}}^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v\bar{2}} \in \{a_{\bar{2}}^{\text{def}}\}) =$ | T                         | $\uparrow$ |              |
| $b_{0...v\bar{2}} = -\lambda^{-1} + c_{0...v} =$ | $-\lambda^{-1} + \mu_0$            | $0 < b_{\bar{2}}^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v\bar{2}} \in \{b_{\bar{2}}^{\text{def}}\}) =$ | F                         | $\uparrow$ |              |
| $c_{0...v\bar{2}} = 1 - d_{0...v} =$             |                                    | $0 < c_{\bar{2}}^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v\bar{2}} \in \{c_{\bar{2}}^{\text{def}}\}) =$ |                           | $\uparrow$ |              |
| $d_{0...v\bar{2}} = 1 - a_{0...v} =$             |                                    | $0 < d_{\bar{2}}^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v\bar{2}} \in \{d_{\bar{2}}^{\text{def}}\}) =$ |                           | $\uparrow$ |              |

|                                             |                        |                                                |                                                                      |                           |            |              |
|---------------------------------------------|------------------------|------------------------------------------------|----------------------------------------------------------------------|---------------------------|------------|--------------|
| $Q_{0...v\bar{3}} = h_{\bar{3}}(Q_{0...v})$ | $Q_{0\bar{4}3\bar{3}}$ | verified                                       | $\Leftarrow$                                                         | $t_k(Q_{0...v\bar{3}}) =$ | T          | $\Leftarrow$ |
| $a_{0...v\bar{3}} = \sqrt{2} - d_{0...v} =$ | $1 - \mu_0$            | $\lambda^{-1} < a_{\bar{3}}^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v\bar{3}} \in \{a_{\bar{3}}^{\text{def}}\}) =$ | T                         | $\uparrow$ |              |
| $b_{0...v\bar{3}} = 1 - a_{0...v} =$        | $\lambda^{-1} + \mu_0$ | $0 < b_{\bar{3}}^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v\bar{3}} \in \{b_{\bar{3}}^{\text{def}}\}) =$ | T                         | $\uparrow$ |              |
| $c_{0...v\bar{3}} = b_{0...v} =$            | $\lambda^{-1} - \mu_0$ | $0 < c_{\bar{3}}^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v\bar{3}} \in \{c_{\bar{3}}^{\text{def}}\}) =$ | T                         | $\uparrow$ |              |
| $d_{0...v\bar{3}} = 1 - c_{0...v} =$        | $1 - \mu_0$            | $\lambda^{-2} < d_{\bar{3}}^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v\bar{3}} \in \{d_{\bar{3}}^{\text{def}}\}) =$ | T                         | $\uparrow$ |              |

|                                                 |                                       |                                                              |                                                                      |                           |            |              |
|-------------------------------------------------|---------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------|---------------------------|------------|--------------|
| $Q_{0...v\bar{4}} = h_{\bar{4}}(Q_{0...v})$     | Forbidden successor of $Q_{0...v}$    |                                                              | $\Leftarrow$                                                         | $t_k(Q_{0...v\bar{4}}) =$ | F          | $\Leftarrow$ |
| $a_{0...v\bar{4}} = 1 - b_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $\lambda^{-1} + \lambda^{-2} < a_{\bar{4}}^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v\bar{4}} \in \{a_{\bar{4}}^{\text{def}}\}) =$ | T                         | $\uparrow$ |              |
| $b_{0...v\bar{4}} = \lambda^{-1} + c_{0...v} =$ | $\lambda^{-1} + \mu_0$                | $\lambda^{-1} < b_{\bar{4}}^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v\bar{4}} \in \{b_{\bar{4}}^{\text{def}}\}) =$ | T                         | $\uparrow$ |              |
| $c_{0...v\bar{4}} = \lambda^{-1} - d_{0...v} =$ | $-\mu_0$                              | $0 < c_{\bar{4}}^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v\bar{4}} \in \{c_{\bar{4}}^{\text{def}}\}) =$ | F                         | $\uparrow$ |              |
| $d_{0...v\bar{4}} = 1 - a_{0...v} =$            |                                       | $\lambda^{-1} < d_{\bar{4}}^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v\bar{4}} \in \{d_{\bar{4}}^{\text{def}}\}) =$ |                           | $\uparrow$ |              |

|                                           |                                       |                                       |                                                        |                     |            |              |
|-------------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | $Q_{0\bar{4}31}$                      | verified                              | $\Leftarrow$                                           | $t_k(Q_{0...v1}) =$ | T          | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-1} + \mu_0$                | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $\mu_0$                               | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $\lambda^{-1} - \mu_0$                | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v1} = 1 - d_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                       |                                                      |                                                        |                     |            |              |
|-------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$    |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ | $-\lambda^{-2} + \mu_0$               | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ |                                       | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - c_{0...v} =$            |                                       | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                       |                                                |                                                                |                     |            |              |
|---------------------------------------|---------------------------------------|------------------------------------------------|----------------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{0\bar{4}3\bar{3}}$                | verified                                       | $\Leftarrow$                                                   | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v} =$        | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $\lambda^{-2} < a_{\bar{3}}^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_{\bar{3}}^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v} =$            | $\mu_0$                               | $0 < b_{\bar{3}}^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_{\bar{3}}^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v} =$        | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $0 < c_{\bar{3}}^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_{\bar{3}}^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v} =$ | $2\lambda^{-1} + \mu_0$               | $\lambda^{-1} < d_{\bar{3}}^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_{\bar{3}}^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                            |                                       |                                                      |                                                        |                     |            |              |
|--------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$    |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | F          | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v4} = 1 - a_{0...v} =$             | $\lambda^{-1} + \mu_0$                | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ |                                       | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                       | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|               |                                       |                      |                                           |   |              |
|---------------|---------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{0433}$                            | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} + \mu_0$ |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\mu_0$                               |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$ |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $2\lambda^{-1} + \mu_0$               |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                             |                                                      |                                                        |                     |            |              |
|--------------------------------------------|-----------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | $Q_{04332}$ <i>verified</i> |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | T          | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $\lambda^{-1} - \mu_0$      | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $\lambda^{-2} - \mu_0$      | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             | $\lambda^{-2} - \mu_0$      | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             | $\lambda^{-1} - \mu_0$      | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{04333}$ <i>verified</i>           |                                        | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
|---------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = 1 - a_{0...v} =$        | $\lambda^{-1} - \mu_0$                | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = b_{0...v} =$            | $\mu_0$                               | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = 1 - c_{0...v} =$        | $\lambda^{-1} + \mu_0$                | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                    |                                                      |                                                        |   |              |
|-------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                                         | $t_k(Q_{0...v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $1 - \mu_0$                        | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $1 - \mu_0$                        | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ |                                    | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0...v4} = 1 - a_{0...v} =$            |                                    | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                           |                                    |                                       |                                                        |   |              |
|-------------------------------------------|------------------------------------|---------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                          | $t_k(Q_{0...v1}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-1} - \mu_0$             | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $\lambda^{-1} - \mu_0$             | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $-\lambda^{-2} + \mu_0$            | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | F | $\uparrow$   |
| $d_{0...v1} = 1 - d_{0...v} =$            |                                    | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                           |                                    |                                                      |                                                        |   |              |
|-------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                                         | $t_k(Q_{0...v2}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\lambda^{-2} - \mu_0$             | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | F | $\uparrow$   |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ |                                    | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |   | $\uparrow$   |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ |                                    | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0...v2} = 1 - c_{0...v} =$            |                                    | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |   | $\uparrow$   |

| $Q_{0...v3} = h_3(Q_{0...v})$                  | $Q_{04333}$ <i>verified</i>           |                                           | $\Leftarrow$                                             | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
|------------------------------------------------|---------------------------------------|-------------------------------------------|----------------------------------------------------------|---------------------|------------|--------------|
| $\mathbf{a_{0...v3} = 1 - b_{0...v} =}$        | $1 - \mu_0$                           | $\lambda^{-2} < \mathbf{a_3^{def}} < 1$   | $\Rightarrow t(\mathbf{a_{0...v3} \in \{a_3^{def}\}}) =$ | T                   | $\uparrow$ |              |
| $\mathbf{b_{0...v3} = c_{0...v} =}$            | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $\mathbf{0 < b_3^{def} < 2 \lambda^{-1}}$ | $\Rightarrow t(\mathbf{b_{0...v3} \in \{b_3^{def}\}}) =$ | T                   | $\uparrow$ |              |
| $\mathbf{c_{0...v3} = 1 - d_{0...v} =}$        | $\lambda^{-2} - \mu_0$                | $\mathbf{0 < c_3^{def} < 2 \lambda^{-1}}$ | $\Rightarrow t(\mathbf{c_{0...v3} \in \{c_3^{def}\}}) =$ | T                   | $\uparrow$ |              |
| $\mathbf{d_{0...v3} = \sqrt{2} - a_{0...v} =}$ | $2 \lambda^{-1} - \mu_0$              | $\lambda^{-1} < \mathbf{d_3^{def}} < 1$   | $\Rightarrow t(\mathbf{d_{0...v3} \in \{d_3^{def}\}}) =$ | T                   | $\uparrow$ |              |

|                                            |                                    |                                                      |                                                        |   |              |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                                         | $t_k(Q_{0...v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\lambda^{-2} - \mu_0$             | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v4} = 1 - a_{0...v} =$             | $\lambda^{-1} - \mu_0$             | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ | $-\lambda^{-1} + \mu_0$            | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                    | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|               |                        |                             |                                           |          |              |
|---------------|------------------------|-----------------------------|-------------------------------------------|----------|--------------|
| $Q_{0...v} =$ | $Q_{04332}$            | <i>Verified predecessor</i> | $t_v(Q_{0...v}) =$                        | <b>T</b> | $\Leftarrow$ |
| $a_{0...v} =$ | $\lambda^{-1} - \mu_0$ |                             | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | <b>T</b> | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-2} - \mu_0$ |                             | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | <b>T</b> | $\uparrow$   |
| $c_{0...v} =$ | $\lambda^{-2} - \mu_0$ |                             | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | <b>T</b> | $\uparrow$   |
| $d_{0...v} =$ | $\lambda^{-1} - \mu_0$ |                             | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | <b>T</b> | $\uparrow$   |

|                                            |                                                      |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | <i>Forbidden successor of <math>Q_{0...v}</math></i> |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | <b>F</b>   | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $\lambda^{-2} + \lambda^{-3} + \mu_0$                | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $-\lambda^{-2} - \lambda^{-3} - \mu_0$               | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | <b>F</b>            | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             |                                                      | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             |                                                      | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                                      |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | <i>Forbidden successor of <math>Q_{0...v}</math></i> |                                        | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | <b>F</b>   | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $1 + \mu_0$                                          | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | <b>F</b>            | $\uparrow$ |              |
| $b_{0...v3} = 1 - a_{0...v} =$        |                                                      | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v3} = b_{0...v} =$            |                                                      | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v3} = 1 - c_{0...v} =$        |                                                      | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                           |                                       |                                                      |                                                        |                     |            |              |
|-------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | $Q_{043324}$                          | <i>verified</i>                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | <b>T</b>   | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $2\lambda^{-1} + \mu_0$               | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ | $\mu_0$                               | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |
| $d_{0...v4} = 1 - a_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |

|                                           |                                       |                                       |                                                        |                     |            |              |
|-------------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | $Q_{043321}$                          | <i>verified</i>                       | $\Leftarrow$                                           | $t_k(Q_{0...v1}) =$ | <b>T</b>   | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |
| $d_{0...v1} = 1 - d_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |

|                                           |                                       |                                                      |                                                        |                     |            |              |
|-------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | $Q_{043322}$                          | <i>verified</i>                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | <b>T</b>   | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ | $\mu_0$                               | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |
| $d_{0...v2} = 1 - c_{0...v} =$            | $2\lambda^{-1} + \mu_0$               | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |

|                                       |                                                      |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | <i>Forbidden successor of <math>Q_{0...v}</math></i> |                                        | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | <b>F</b>   | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v} =$        | $2\lambda^{-1} - \mu_0$                              | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v} =$            | $\lambda^{-2} - \mu_0$                               | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v} =$        | $\lambda^{-1} + \lambda^{-2} + \mu_0$                | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | <b>T</b>            | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v} =$ | $1 + \mu_0$                                          | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | <b>F</b>            | $\uparrow$ |              |

|                                            |                                                      |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | <i>Forbidden successor of <math>Q_{0...v}</math></i> |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | <b>F</b>   | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\lambda^{-1} + \lambda^{-2} + \mu_0$                | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | <b>F</b>            | $\uparrow$ |              |
| $b_{0...v4} = 1 - a_{0...v} =$             |                                                      | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ |                                                      | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                                      | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |



|               |                                       |                      |                                           |   |              |
|---------------|---------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{043324}$                          | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $2\lambda^{-1} + \mu_0$               |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$ |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\mu_0$                               |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} + \mu_0$ |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                                    |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $-\lambda^{-2} + \mu_0$            | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ |                                    | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             |                                    | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             |                                    | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                       |                                        |                                                        |                     |            |              |
|---------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{0433243}$                         | verified                               | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $2\lambda^{-1} - \mu_0$               | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = 1 - a_{0...v} =$        | $\lambda^{-2} - \mu_0$                | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = b_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = 1 - c_{0...v} =$        | $1 - \mu_0$                           | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                    |                                                      |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | F          | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $\lambda^{-1} + \mu_0$             | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ |                                    | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ |                                    | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v4} = 1 - a_{0...v} =$            |                                    | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                           |                                    |                                       |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------|---------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ |                                       | $\Leftarrow$                                           | $t_k(Q_{0...v1}) =$ | F          | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-2} - \mu_0$             | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $-\lambda^{-2} + \mu_0$            | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ |                                    | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v1} = 1 - d_{0...v} =$            |                                    | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                           |                                    |                                                      |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\lambda^{-1} - \mu_0$             | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ |                                    | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ |                                    | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - c_{0...v} =$            |                                    | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                       |                                        |                                                        |                     |            |              |
|---------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{0433243}$                         | verified                               | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v} =$        | $\lambda^{-1} + \mu_0$                | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v} =$            | $\mu_0$                               | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v} =$        | $\lambda^{-1} - \mu_0$                | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                            |                        |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | $Q_{0433244}$          | verified                                             | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | T          | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\lambda^{-1} - \mu_0$ | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v4} = 1 - a_{0...v} =$             | $\lambda^{-2} - \mu_0$ | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ | $\lambda^{-2} - \mu_0$ | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  | $\lambda^{-1} - \mu_0$ | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|               |                                       |                      |                                           |   |              |
|---------------|---------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{0433243}$                         | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $2\lambda^{-1} - \mu_0$               |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-2} - \mu_0$                |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$ |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $1 - \mu_0$                           |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                                       |                                                      |               |                                            |   |              |
|--------------------------------------------|---------------------------------------|------------------------------------------------------|---------------|--------------------------------------------|---|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | $Q_{04332432}$ <i>verified</i>        |                                                      | $\Leftarrow$  | $t_k(Q_{0...v2}) =$                        | T | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow$ | $t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $\lambda^{-2} - \mu_0$                | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow$ | $t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v2} = 1 - d_{0...v} =$             | $\mu_0$                               | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow$ | $t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v2} = 1 - a_{0...v} =$             | $\lambda^{-2} + \mu_0$                | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow$ | $t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ | T | $\uparrow$   |

| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{04332433}$ <i>verified</i> |                                         | $\Leftarrow$                                           | $t_k(Q_{0...v3}) = T$ | $\Leftarrow$ |
|---------------------------------------|--------------------------------|-----------------------------------------|--------------------------------------------------------|-----------------------|--------------|
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $\lambda^{-1} + \mu_0$         | $\lambda^{-1} < a_3^{\text{def}} < 1$   | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                     | $\uparrow$   |
| $b_{0...v3} = 1 - a_{0...v} =$        | $\lambda^{-2} + \mu_0$         | $0 < b_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                     | $\uparrow$   |
| $c_{0...v3} = b_{0...v} =$            | $\lambda^{-2} - \mu_0$         | $0 < c_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                     | $\uparrow$   |
| $d_{0...v3} = 1 - c_{0...v} =$        | $\lambda^{-1} + \mu_0$         | $\lambda^{-2} < d_3^{\text{def}} < 1$   | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                     | $\uparrow$   |

|                                           |                                    |                                                      |                                                        |   |              |
|-------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                                         | $t_k(Q_{0...v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $2\lambda^{-1} + \mu_0$            | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $1 - \mu_0$                        | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ |                                    | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0...v4} = 1 - a_{0...v} =$            |                                    | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                           |                                       |                                       |                                                        |   |              |
|-------------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$    | $\Leftarrow$                          | $t_k(Q_{0...v1}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-2} + \mu_0$                | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $-\lambda^{-2} + \mu_0$               | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | F | $\uparrow$   |
| $d_{0...v1} = 1 - d_{0...v} =$            |                                       | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                           |                                    |                                                      |                                                        |   |              |
|-------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                                         | $t_k(Q_{0...v2}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\mu_0$                            | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | F | $\uparrow$   |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ |                                    | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |   | $\uparrow$   |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ |                                    | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0...v2} = 1 - c_{0...v} =$            |                                    | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                     |                                       |                                         |                                                        |                     |            |              |
|-------------------------------------|---------------------------------------|-----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$       | $Q_{04332433}$ <i>verified</i>        |                                         | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v}$        | $2 \lambda^{-1} + \mu_0$              | $\lambda^{-2} < a_3^{\text{def}} < 1$   | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v}$            | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $0 < b_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v}$        | $\mu_0$                               | $0 < c_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v}$ | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $\lambda^{-1} < d_3^{\text{def}} < 1$   | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                            |                                        |                                                      |                                                        |   |              |
|--------------------------------------------|----------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$     | $\Leftarrow$                                         | $t_k(Q_{0...v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\mu_0$                                | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v4} = 1 - a_{0...v} =$             | $\lambda^{-2} + \mu_0$                 | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ | $-\lambda^{-2} - \lambda^{-3} - \mu_0$ | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                        | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|               |                                       |                      |                                           |   |              |
|---------------|---------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{04332432}$                        | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$ |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-2} - \mu_0$                |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\mu_0$                               |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $\lambda^{-2} + \mu_0$                |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                                       |                                                      |                                                        |                     |            |              |
|--------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$    |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $-\lambda^{-1} + \mu_0$               | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             |                                       | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             |                                       | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                           |                                        |                                                        |                     |            |              |
|---------------------------------------|-------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | Forbidden successor of $Q_{0...v}$        |                                        | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | F          | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $1 + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v3} = 1 - a_{0...v} =$        |                                           | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v3} = b_{0...v} =$            |                                           | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v3} = 1 - c_{0...v} =$        |                                           | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                           |                                        |                                                      |                                                        |                     |            |              |
|-------------------------------------------|----------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | $Q_{043324324}$                        | verified                                             | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | T          | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $2\lambda^{-1} + \mu_0$                | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $\lambda^{-1} + \mu_0$                 | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} - \mu_0$  | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v4} = 1 - a_{0...v} =$            | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$ | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                        |                                       |                                                        |                     |            |              |
|-------------------------------------------|----------------------------------------|---------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | $Q_{043324321}$                        | verified                              | $\Leftarrow$                                           | $t_k(Q_{0...v1}) =$ | T          | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$ | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$  | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $\lambda^{-1} - \mu_0$                 | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v1} = 1 - d_{0...v} =$            | $2\lambda^{-1} - \mu_0$                | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                       |                                                      |                                                        |                     |            |              |
|-------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | $Q_{043324322}$                       | verified                                             | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | T          | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $2\lambda^{-1} - \mu_0$               | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ | $\lambda^{-2} - \mu_0$                | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v2} = 1 - c_{0...v} =$            | $1 - \mu_0$                           | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                       |                                    |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | Forbidden successor of $Q_{0...v}$ |                                        | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | F          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v} =$        | $2\lambda^{-1} + \mu_0$            | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v} =$            | $\mu_0$                            | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v} =$        | $2\lambda^{-1} - \mu_0$            | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v} =$ | $1 + \lambda^{-2} - \mu_0$         | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |

|                                            |                                    |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | F          | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $2\lambda^{-1} - \mu_0$            | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v4} = 1 - a_{0...v} =$             |                                    | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ |                                    | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                    | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|               |                                        |                      |                                           |   |              |
|---------------|----------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{043324324}$                        | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $2\lambda^{-1} + \mu_0$                |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-1} + \mu_0$                 |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} - \mu_0$  |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$ |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                                    |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $-\mu_0$                           | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ |                                    | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             |                                    | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             |                                    | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                                      |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{0433243243}$                                     | verified                               | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = 1 - a_{0...v} =$        | $\lambda^{-2} - \mu_0$                               | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = b_{0...v} =$            | $\lambda^{-1} + \mu_0$                               | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = 1 - c_{0...v} =$        | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$               | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                       |                                                      |                                                        |                     |            |              |
|-------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$    |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | F          | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ |                                       | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ |                                       | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v4} = 1 - a_{0...v} =$            |                                       | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                           |                                    |                                       |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------|---------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ |                                       | $\Leftarrow$                                           | $t_k(Q_{0...v1}) =$ | F          | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-2} - \mu_0$             | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $-\mu_0$                           | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ |                                    | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v1} = 1 - d_{0...v} =$            |                                    | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                           |                                       |                                                      |                                                        |                     |            |              |
|-------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$    |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ |                                       | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ |                                       | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - c_{0...v} =$            |                                       | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                       |                                        |                                                        |                     |            |              |
|---------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{0433243243}$                      | verified                               | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v} =$        | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v} =$            | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v} =$        | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                            |                                       |                                                      |                                                        |                     |            |              |
|--------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | $Q_{0433243244}$                      | verified                                             | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | T          | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v4} = 1 - a_{0...v} =$             | $\lambda^{-2} - \mu_0$                | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ | $\mu_0$                               | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  | $\lambda^{-2} + \mu_0$                | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|               |                                                      |                      |                                           |   |              |
|---------------|------------------------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{0433243243}$                                     | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-2} - \mu_0$                               |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\lambda^{-1} + \mu_0$                               |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$               |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

| $Q_{0...v2} = h_2(Q_{0...v})$              | $Q_{04332432432}$                     |                                                      | verified                                               | $\Leftarrow$ | $t_k(Q_{0...v2}) =$ | T | $\Leftarrow$ |
|--------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|--------------|---------------------|---|--------------|
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ |              | T                   |   | $\uparrow$   |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $\mu_0$                               | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |              | T                   |   | $\uparrow$   |
| $c_{0...v2} = 1 - d_{0...v} =$             | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |              | T                   |   | $\uparrow$   |
| $d_{0...v2} = 1 - a_{0...v} =$             | $2\lambda^{-2} - \mu_0$               | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |              | T                   |   | $\uparrow$   |

| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{04332432433}$ <i>verified</i>                    |                                        | $\Leftarrow$                                           | $t_k(Q_{0...v3}) = T$ | $\Leftarrow$ |
|---------------------------------------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------|-----------------------|--------------|
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                     | $\uparrow$   |
| $b_{0...v3} = 1 - a_{0...v} =$        | $2\lambda^{-2} - \mu_0$                              | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                     | $\uparrow$   |
| $c_{0...v3} = b_{0...v} =$            | $\lambda^{-2} - \mu_0$                               | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                     | $\uparrow$   |
| $d_{0...v3} = 1 - c_{0...v} =$        | $\lambda^{-1} + \lambda^{-2} - \mu_0$                | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                     | $\uparrow$   |

|                                           |                                    |                                                      |                                                        |   |              |
|-------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                                         | $t_k(Q_{0...v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $2\lambda^{-1} + \mu_0$            | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $2\lambda^{-1} + \mu_0$            | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ |                                    | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0...v4} = 1 - a_{0...v} =$            |                                    | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                           |                                       |                                       |                                                        |   |              |
|-------------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$    | $\Leftarrow$                          | $t_k(Q_{0...v1}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $2\lambda^{-2} - \mu_0$               | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $-\mu_0$                              | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | F | $\uparrow$   |
| $d_{0...v1} = 1 - d_{0...v} =$            |                                       | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                           |                                       |                                                      |                                                        |   |              |
|-------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$    | $\Leftarrow$                                         | $t_k(Q_{0...v2}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | F | $\uparrow$   |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ |                                       | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |   | $\uparrow$   |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ |                                       | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0...v2} = 1 - c_{0...v} =$            |                                       | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                     |                                         |                                         |                                                        |                     |            |              |
|-------------------------------------|-----------------------------------------|-----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$       | $Q_{04332432433}$ <i>verified</i>       |                                         | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v}$        | $2 \lambda^{-1} + \mu_0$                | $\lambda^{-2} < a_3^{\text{def}} < 1$   | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v}$            | $\lambda^{-1} + \mu_0$                  | $0 < b_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v}$        | $\lambda^{-2} + \lambda^{-3} - \mu_0$   | $0 < c_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v}$ | $\lambda^{-1} + 2 \lambda^{-2} - \mu_0$ | $\lambda^{-1} < d_3^{\text{def}} < 1$   | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                            |                                        |                                                      |                                                        |   |              |
|--------------------------------------------|----------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$     | $\Leftarrow$                                         | $t_k(Q_{0...v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\lambda^{-2} + \lambda^{-3} - \mu_0$  | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v4} = 1 - a_{0...v} =$             | $2\lambda^{-2} - \mu_0$                | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ | $-\lambda^{-2} - \lambda^{-3} - \mu_0$ | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                        | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|               |                                                      |                      |                                           |   |              |
|---------------|------------------------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{04332432433}$                                    | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $2\lambda^{-2} - \mu_0$                              |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\lambda^{-2} - \mu_0$                               |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$                |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                                        |                                                      |                                                        |                     |            |              |
|--------------------------------------------|----------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$     |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $\lambda^{-3} + \mu_0$                 | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $-\lambda^{-2} - \lambda^{-3} - \mu_0$ | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             |                                        | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             |                                        | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                         |                                        |                                                        |                     |            |              |
|---------------------------------------|-------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{043324324333}$      | verified                               | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $2\lambda^{-1} + \mu_0$ | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = 1 - a_{0...v} =$        | $2\lambda^{-2} + \mu_0$ | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = b_{0...v} =$            | $2\lambda^{-2} - \mu_0$ | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = 1 - c_{0...v} =$        | $2\lambda^{-1} + \mu_0$ | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                                      |                                                      |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$                   |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | F          | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$                | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ | $-\lambda^{-2} + \mu_0$                              | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $d_{0...v4} = 1 - a_{0...v} =$            |                                                      | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                           |                                       |                                       |                                                        |                     |            |              |
|-------------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | $Q_{043324324331}$                    | verified                              | $\Leftarrow$                                           | $t_k(Q_{0...v1}) =$ | T          | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $2\lambda^{-2} + \mu_0$               | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $\lambda^{-3} + \mu_0$                | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v1} = 1 - d_{0...v} =$            | $\lambda^{-1} + \mu_0$                | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                        |                                                      |                                                        |                     |            |              |
|-------------------------------------------|----------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$     |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\lambda^{-1} + \mu_0$                 | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ | $-\lambda^{-2} - \lambda^{-3} + \mu_0$ | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ |                                        | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - c_{0...v} =$            |                                        | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                                      |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{043324324333}$                                   | verified                               | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v} =$        | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v} =$            | $\lambda^{-2} - \mu_0$                               | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v} =$        | $\lambda^{-1} + \mu_0$                               | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v} =$ | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$               | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                            |                                    |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | F          | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\lambda^{-1} + \mu_0$             | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v4} = 1 - a_{0...v} =$             | $2\lambda^{-2} + \mu_0$            | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ | $-\lambda^{-3} - \mu_0$            | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                    | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|               |                         |                      |                                           |   |              |
|---------------|-------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{043324324333}$      | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $2\lambda^{-1} + \mu_0$ |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $2\lambda^{-2} + \mu_0$ |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $2\lambda^{-2} - \mu_0$ |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $2\lambda^{-1} + \mu_0$ |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                                    |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $\lambda^{-3} - \mu_0$             | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $-\lambda^{-3} - \mu_0$            | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             |                                    | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             |                                    | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                                      |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{0433243243333}$                                  | verified                               | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$                | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = 1 - a_{0...v} =$        | $\lambda^{-2} - \mu_0$                               | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = b_{0...v} =$            | $2\lambda^{-2} + \mu_0$                              | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = 1 - c_{0...v} =$        | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                                      |                                                      |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$                   |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | F          | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$               | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ | $-\lambda^{-1} - \mu_0$                              | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $d_{0...v4} = 1 - a_{0...v} =$            |                                                      | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                           |                        |                                       |                                                        |                     |            |              |
|-------------------------------------------|------------------------|---------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | $Q_{0433243243331}$    | verified                              | $\Leftarrow$                                           | $t_k(Q_{0...v1}) =$ | T          | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-2} - \mu_0$ | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $\lambda^{-3} - \mu_0$ | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $\lambda^{-3} + \mu_0$ | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v1} = 1 - d_{0...v} =$            | $\lambda^{-2} - \mu_0$ | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                    |                                                      |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\lambda^{-2} - \mu_0$             | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ |                                    | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ |                                    | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - c_{0...v} =$            |                                    | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                                      |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{0433243243333}$                                  | verified                               | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v} =$        | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v} =$            | $2\lambda^{-2} - \mu_0$                              | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v} =$        | $\lambda^{-2} - \mu_0$                               | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$                | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                            |                                    |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | F          | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\lambda^{-2} - \mu_0$             | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v4} = 1 - a_{0...v} =$             | $\lambda^{-2} - \mu_0$             | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ | $-\lambda^{-3} + \mu_0$            | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                    | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                  |                        |                      |                                              |   |              |
|------------------|------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{0433243243331}$    | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $\lambda^{-2} - \mu_0$ |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\lambda^{-3} - \mu_0$ |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\lambda^{-3} + \mu_0$ |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $\lambda^{-2} - \mu_0$ |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =$  | $2\lambda^{-2} + \mu_0$               | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =$ | $-2\lambda^{-2} + \mu_0$              | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v2} = 1 - d_{0\dots v} =$             |                                       | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - a_{0\dots v} =$             |                                       | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                           |                                        |                                                           |                        |            |              |
|---------------------------------------------|-------------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | Forbidden successor of $Q_{0\dots v}$     |                                        | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v3} = \sqrt{2} - d_{0\dots v} =$ | $1 + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v3} = 1 - a_{0\dots v} =$        |                                           | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v3} = b_{0\dots v} =$            |                                           | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v3} = 1 - c_{0\dots v} =$        |                                           | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$             | $Q_{04332432433314}$                  | verified                                             | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - b_{0\dots v} =$            | $1 - \lambda^{-3} + \mu_0$            | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v4} = 1 - a_{0\dots v} =$            | $2\lambda^{-1} + \mu_0$               | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                         |                                       |                                                           |                        |            |              |
|-------------------------------------------------|-------------------------|---------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | $Q_{04332432433311}$    | verified                              | $\Leftarrow$                                              | $t_k(Q_{0\dots v1}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $2\lambda^{-1} + \mu_0$ | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $2\lambda^{-2} + \mu_0$ | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ | $2\lambda^{-2} - \mu_0$ | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            | $2\lambda^{-1} + \mu_0$ | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | $Q_{04332432433312}$                  | verified                                             | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $2\lambda^{-1} + \mu_0$               | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            | $1 - \lambda^{-3} - \mu_0$            | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                             |                                       |                                        |                                                           |                        |            |              |
|---------------------------------------------|---------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | Forbidden successor of $Q_{0\dots v}$ |                                        | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $1 - \lambda^{-3} + \mu_0$            | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $\lambda^{-3} + \mu_0$                | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $2\lambda^{-1} + \mu_0$               | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ |                                       | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $2\lambda^{-1} + \mu_0$               | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             |                                       | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ |                                       | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  |                                       | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |



|               |                                       |                      |                                           |   |              |
|---------------|---------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{04332432433312}$                  | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $2\lambda^{-1} + \mu_0$               |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$ |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\lambda^{-1} + \lambda^{-3} - \mu_0$ |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $1 - \lambda^{-3} - \mu_0$            |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                        |                                                      |                                                        |              |                     |            |              |
|--------------------------------------------|------------------------|------------------------------------------------------|--------------------------------------------------------|--------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | $Q_{043324324333122}$  |                                                      | <i>verified</i>                                        | $\Leftarrow$ | $t_k(Q_{0...v2}) =$ | T          | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $\lambda^{-2} - \mu_0$ | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ |              | T                   | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $\lambda^{-3} - \mu_0$ | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |              | T                   | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             | $\lambda^{-3} + \mu_0$ | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |              | T                   | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             | $\lambda^{-2} - \mu_0$ | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |              | T                   | $\uparrow$ |              |

|                                       |                                                      |                                         |                                                        |                       |              |
|---------------------------------------|------------------------------------------------------|-----------------------------------------|--------------------------------------------------------|-----------------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{043324324333123}$ <i>verified</i>                |                                         | $\Leftarrow$                                           | $t_k(Q_{0...v3}) = T$ | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $\lambda^{-1} + \lambda^{-3} + \mu_0$                | $\lambda^{-1} < a_3^{\text{def}} < 1$   | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                     | $\uparrow$   |
| $b_{0...v3} = 1 - a_{0...v} =$        | $\lambda^{-2} - \mu_0$                               | $0 < b_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                     | $\uparrow$   |
| $c_{0...v3} = b_{0...v} =$            | $\lambda^{-2} + \lambda^{-3} + \mu_0$                | $0 < c_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                     | $\uparrow$   |
| $d_{0...v3} = 1 - c_{0...v} =$        | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} + \mu_0$ | $\lambda^{-2} < d_3^{\text{def}} < 1$   | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                     | $\uparrow$   |

|                                           |                                        |                                                      |                                                        |   |              |
|-------------------------------------------|----------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$     | $\Leftarrow$                                         | $t_k(Q_{0...v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$ | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $2\lambda^{-1} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ |                                        | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0...v4} = 1 - a_{0...v} =$            |                                        | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                           |                                    |                                       |                                                        |   |              |
|-------------------------------------------|------------------------------------|---------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                          | $t_k(Q_{0...v1}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-2} - \mu_0$             | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $\lambda^{-2} - \mu_0$             | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $-\lambda^{-3} + \mu_0$            | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | F | $\uparrow$   |
| $d_{0...v1} = 1 - d_{0...v} =$            |                                    | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                           |                                    |                                                      |                                                        |   |              |
|-------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                                         | $t_k(Q_{0...v2}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\lambda^{-3} + \mu_0$             | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | F | $\uparrow$   |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ |                                    | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |   | $\uparrow$   |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ |                                    | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0...v2} = 1 - c_{0...v} =$            |                                    | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                                                 |                                        |                                                 |                                                                             |              |                        |            |              |
|-----------------------------------------------------------------|----------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------|--------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$                             | $Q_{043324324333123}$                  |                                                 | <i>verified</i>                                                             | $\Leftarrow$ | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $\mathbf{a}_{0\dots v3} = \mathbf{1} - \mathbf{b}_{0\dots v} =$ | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$ | $\lambda^{-2} < \mathbf{a}_3^{\text{def}} < 1$  | $\Rightarrow t(\mathbf{a}_{0\dots v3} \in \{\mathbf{a}_3^{\text{def}}\}) =$ |              | T                      | $\uparrow$ |              |
| $\mathbf{b}_{0\dots v3} = \mathbf{c}_{0\dots v} =$              | $\lambda^{-1} + \lambda^{-3} - \mu_0$  | $0 < \mathbf{b}_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(\mathbf{b}_{0\dots v3} \in \{\mathbf{b}_3^{\text{def}}\}) =$ |              | T                      | $\uparrow$ |              |
| $\mathbf{c}_{0\dots v3} = \mathbf{1} - \mathbf{d}_{0\dots v} =$ | $\lambda^{-3} + \mu_0$                 | $0 < \mathbf{c}_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(\mathbf{c}_{0\dots v3} \in \{\mathbf{c}_3^{\text{def}}\}) =$ |              | T                      | $\uparrow$ |              |
| $\mathbf{d}_{0\dots v3} = \sqrt{2} - \mathbf{a}_{0\dots v} =$   | $\lambda^{-1} + \lambda^{-2} - \mu_0$  | $\lambda^{-1} < \mathbf{d}_3^{\text{def}} < 1$  | $\Rightarrow t(\mathbf{d}_{0\dots v3} \in \{\mathbf{d}_3^{\text{def}}\}) =$ |              | T                      | $\uparrow$ |              |

|                                            |                                    |                                                      |                                                        |   |              |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                                         | $t_k(Q_{0...v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\lambda^{-3} + \mu_0$             | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v4} = 1 - a_{0...v} =$             | $\lambda^{-2} - \mu_0$             | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ | $-\lambda^{-2} + \mu_0$            | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                    | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|               |                                        |                      |                                           |   |              |
|---------------|----------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{0433243243331233}$                 | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$ |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-1} + \lambda^{-3} - \mu_0$  |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\lambda^{-3} + \mu_0$                 |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$  |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                                    |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $-\lambda^{-3} + \mu_0$            | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ |                                    | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             |                                    | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             |                                    | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                       |                                        |                                                        |                     |            |              |
|---------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{0433243243331233}$                | verified                               | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $2\lambda^{-1} + \mu_0$               | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = 1 - a_{0...v} =$        | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = b_{0...v} =$            | $\lambda^{-1} + \lambda^{-3} - \mu_0$ | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = 1 - c_{0...v} =$        | $1 - \lambda^{-3} - \mu_0$            | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                                      |                                                      |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$                   |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | F          | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} + \mu_0$ | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ |                                                      | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ |                                                      | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v4} = 1 - a_{0...v} =$            |                                                      | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                           |                                       |                                       |                                                        |                     |            |              |
|-------------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$    |                                       | $\Leftarrow$                                           | $t_k(Q_{0...v1}) =$ | F          | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $-\lambda^{-3} + \mu_0$               | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ |                                       | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v1} = 1 - d_{0...v} =$            |                                       | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                           |                                    |                                                      |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\lambda^{-1} + \mu_0$             | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ | $-2\lambda^{-2} + \mu_0$           | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ |                                    | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - c_{0...v} =$            |                                    | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                                      |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{0433243243331233}$                               | verified                               | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v} =$        | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} + \mu_0$ | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v} =$            | $\lambda^{-3} + \mu_0$                               | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v} =$        | $\lambda^{-1} + \mu_0$                               | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                            |                                       |                                                      |                                                        |                     |            |              |
|--------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | $Q_{0433243243331234}$                | verified                                             | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | T          | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\lambda^{-1} + \mu_0$                | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v4} = 1 - a_{0...v} =$             | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ | $\lambda^{-3} - \mu_0$                | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  | $2\lambda^{-2} - \mu_0$               | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|               |                                                      |                      |                                           |   |              |
|---------------|------------------------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{0433243243331233}$                               | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} + \mu_0$ |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-3} + \mu_0$                               |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\lambda^{-1} + \mu_0$                               |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                                         |                                                      |               |                                            |   |              |
|--------------------------------------------|-----------------------------------------|------------------------------------------------------|---------------|--------------------------------------------|---|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | $Q_{04332432433312332}$ <i>verified</i> |                                                      | $\Leftarrow$  | $t_k(Q_{0...v2}) =$                        | T | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $2 \lambda^{-2} - \mu_0$                | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow$ | $t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $\mu_0$                                 | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow$ | $t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v2} = 1 - d_{0...v} =$             | $2 \lambda^{-2} - \mu_0$                | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow$ | $t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v2} = 1 - a_{0...v} =$             | $\lambda^{-1} + \lambda^{-3} - \mu_0$   | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow$ | $t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                       |                                        |                                        |                                                        |              |                       |              |
|---------------------------------------|----------------------------------------|----------------------------------------|--------------------------------------------------------|--------------|-----------------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{04332432433312333}$                |                                        | <i>verified</i>                                        | $\Leftarrow$ | $t_k(Q_{0...v3}) = T$ | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$ | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T            | $\uparrow$            |              |
| $b_{0...v3} = 1 - a_{0...v} =$        | $\lambda^{-1} + \lambda^{-3} - \mu_0$  | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T            | $\uparrow$            |              |
| $c_{0...v3} = b_{0...v} =$            | $\lambda^{-3} + \mu_0$                 | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T            | $\uparrow$            |              |
| $d_{0...v3} = 1 - c_{0...v} =$        | $\lambda^{-1} + \lambda^{-2} - \mu_0$  | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T            | $\uparrow$            |              |

|                                           |                                    |                                                      |                                                        |   |              |
|-------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                                         | $t_k(Q_{0...v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $1 - \lambda^{-3} - \mu_0$         | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $2\lambda^{-1} + \mu_0$            | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ |                                    | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0...v4} = 1 - a_{0...v} =$            |                                    | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                           |                                       |                                       |                                                        |   |              |
|-------------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$    | $\Leftarrow$                          | $t_k(Q_{0...v1}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-1} + \lambda^{-3} - \mu_0$ | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $2\lambda^{-2} - \mu_0$               | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $-\mu_0$                              | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | F | $\uparrow$   |
| $d_{0...v1} = 1 - d_{0...v} =$            |                                       | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                           |                                    |                                                      |                                                        |   |              |
|-------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                                         | $t_k(Q_{0...v2}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $2\lambda^{-2} - \mu_0$            | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | F | $\uparrow$   |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ |                                    | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |   | $\uparrow$   |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ |                                    | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0...v2} = 1 - c_{0...v} =$            |                                    | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                                                 |                                         |                                                 |                                                                             |                        |            |              |
|-----------------------------------------------------------------|-----------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$                             | $Q_{04332432433312333}$ <i>verified</i> |                                                 | $\Leftarrow$                                                                | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $\mathbf{a}_{0\dots v3} = \mathbf{1} - \mathbf{b}_{0\dots v} =$ | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$  | $\lambda^{-2} < \mathbf{a}_3^{\text{def}} < 1$  | $\Rightarrow t(\mathbf{a}_{0\dots v3} \in \{\mathbf{a}_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $\mathbf{b}_{0\dots v3} = \mathbf{c}_{0\dots v} =$              | $\lambda^{-1} + \mu_0$                  | $0 < \mathbf{b}_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(\mathbf{b}_{0\dots v3} \in \{\mathbf{b}_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $\mathbf{c}_{0\dots v3} = \mathbf{1} - \mathbf{d}_{0\dots v} =$ | $2\lambda^{-2} - \mu_0$                 | $0 < \mathbf{c}_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(\mathbf{c}_{0\dots v3} \in \{\mathbf{c}_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $\mathbf{d}_{0\dots v3} = \sqrt{2} - \mathbf{a}_{0\dots v} =$   | $2\lambda^{-1} + \lambda^{-3} - \mu_0$  | $\lambda^{-1} < \mathbf{d}_3^{\text{def}} < 1$  | $\Rightarrow t(\mathbf{d}_{0\dots v3} \in \{\mathbf{d}_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                            |                                       |                                                      |                                                        |   |              |
|--------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$    | $\Leftarrow$                                         | $t_k(Q_{0...v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $2\lambda^{-2} - \mu_0$               | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v4} = 1 - a_{0...v} =$             | $\lambda^{-1} + \lambda^{-3} - \mu_0$ | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ |                                       | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                       | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|                  |                                       |                      |                                              |   |              |
|------------------|---------------------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{04332432433312332}$               | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $2\lambda^{-2} - \mu_0$               |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\mu_0$                               |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $2\lambda^{-2} - \mu_0$               |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-3} - \mu_0$ |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =$  | $\lambda^{-1} - \mu_0$                | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =$ | $-\lambda^{-3} - \mu_0$               | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v2} = 1 - d_{0\dots v} =$             |                                       | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - a_{0\dots v} =$             |                                       | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                                      |                                        |                                                           |                        |            |              |
|---------------------------------------------|------------------------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{043324324333123323}$                             | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = \sqrt{2} - d_{0\dots v} =$ | $1 - \lambda^{-3} - \mu_0$                           | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = 1 - a_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = b_{0\dots v} =$            | $\mu_0$                                              | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = 1 - c_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - b_{0\dots v} =$            | $\lambda^{-1} - \mu_0$                | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =$ |                                       | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =$ |                                       | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v4} = 1 - a_{0\dots v} =$            |                                       | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                 |                                                      |                                       |                                                           |                        |            |              |
|-------------------------------------------------|------------------------------------------------------|---------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | $Q_{043324324333123321}$                             | verified                              | $\Leftarrow$                                              | $t_k(Q_{0\dots v1}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $\lambda^{-1} - \mu_0$                               | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ | $\lambda^{-3} + \mu_0$                               | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} + \mu_0$ | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                                      |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | $Q_{043324324333123322}$                             | verified                                             | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} + \mu_0$ | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ | $\lambda^{-3} + \mu_0$                               | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ | $\lambda^{-1} + \mu_0$                               | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                             |                                                      |                                        |                                                           |                        |            |              |
|---------------------------------------------|------------------------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | Forbidden successor of $Q_{0\dots v}$                |                                        | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $1 - \mu_0$                                          | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $2\lambda^{-2} - \mu_0$                              | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} + \mu_0$ | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ | $1 + \lambda^{-3} + \mu_0$                           | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |

|                                                  |                                                      |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$                |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} + \mu_0$ | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ |                                                      | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  |                                                      | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                  |                                                      |                      |                                              |   |              |
|------------------|------------------------------------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{043324324333123321}$                             | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\lambda^{-1} - \mu_0$                               |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\lambda^{-3} + \mu_0$                               |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} + \mu_0$ |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =$  | $\mu_0$                               | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =$ | $-2\lambda^{-2} + \mu_0$              | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v2} = 1 - d_{0\dots v} =$             |                                       | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - a_{0\dots v} =$             |                                       | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                        |                                        |                                                           |                        |            |              |
|---------------------------------------------|----------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{0433243243331233213}$              | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = \sqrt{2} - d_{0\dots v} =$ | $2\lambda^{-1} + \lambda^{-2} + \mu_0$ | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = 1 - a_{0\dots v} =$        | $2\lambda^{-2} - \mu_0$                | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = b_{0\dots v} =$            | $\lambda^{-1} - \mu_0$                 | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = 1 - c_{0\dots v} =$        | $1 - \lambda^{-3} - \mu_0$             | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                        |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|----------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$  |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - b_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-2} + \mu_0$  | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-3} + \mu_0$  | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =$ | $-\lambda^{-3} - \lambda^{-4} - \mu_0$ | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $d_{0\dots v4} = 1 - a_{0\dots v} =$            |                                        | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                 |                                       |                                       |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|---------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | $Q_{0433243243331233211}$             | verified                              | $\Leftarrow$                                              | $t_k(Q_{0\dots v1}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $2\lambda^{-2} - \mu_0$               | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $\mu_0$                               | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ | $2\lambda^{-2} - \mu_0$               | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-3} - \mu_0$ | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                        |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|----------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$  |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-3} - \mu_0$  | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ | $-\lambda^{-2} - \lambda^{-3} - \mu_0$ | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ |                                        | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            |                                        | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                        |                                        |                                                           |                        |            |              |
|---------------------------------------------|----------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{0433243243331233213}$              | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-2} + \mu_0$  | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $\lambda^{-3} + \mu_0$                 | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-3} - \mu_0$  | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$ | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $\lambda^{-1} + \lambda^{-3} - \mu_0$ | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             | $2\lambda^{-2} - \mu_0$               | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ | $-\mu_0$                              | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  |                                       | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                  |                                        |                      |                                              |   |              |
|------------------|----------------------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{0433243243331233213}$              | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \mu_0$  |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\lambda^{-3} + \mu_0$                 |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-3} - \mu_0$  |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$ |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                  |                                       |                                                      |                                                           |              |                        |   |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|--------------|------------------------|---|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$              | $Q_{04332432433312332132}$            |                                                      | <i>verified</i>                                           | $\Leftarrow$ | $t_k(Q_{0\dots v2}) =$ | T | $\Leftarrow$ |
| $a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =$  | $2\lambda^{-2} - \mu_0$               | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T            | $\uparrow$             |   |              |
| $b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =$ | $\lambda^{-3} - \mu_0$                | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | T            | $\uparrow$             |   |              |
| $c_{0\dots v2} = 1 - d_{0\dots v} =$             | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ | T            | $\uparrow$             |   |              |
| $d_{0\dots v2} = 1 - a_{0\dots v} =$             | $\lambda^{-1} - \mu_0$                | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ | T            | $\uparrow$             |   |              |

|                                                               |                                                      |                                                 |                                                                             |              |                                   |              |
|---------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------|--------------|-----------------------------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$                           | $Q_{04332432433312332133}$                           |                                                 | <i>verified</i>                                                             | $\Leftarrow$ | $t_k(Q_{0\dots v3}) = \mathbf{T}$ | $\Leftarrow$ |
| $\mathbf{a}_{0\dots v3} = \sqrt{2} - \mathbf{d}_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < \mathbf{a}_3^{\text{def}} < 1$  | $\Rightarrow t(\mathbf{a}_{0\dots v3} \in \{\mathbf{a}_3^{\text{def}}\}) =$ | $\mathbf{T}$ | $\uparrow$                        |              |
| $\mathbf{b}_{0\dots v3} = 1 - \mathbf{a}_{0\dots v} =$        | $\lambda^{-1} - \mu_0$                               | $0 < \mathbf{b}_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(\mathbf{b}_{0\dots v3} \in \{\mathbf{b}_3^{\text{def}}\}) =$ | $\mathbf{T}$ | $\uparrow$                        |              |
| $\mathbf{c}_{0\dots v3} = \mathbf{b}_{0\dots v} =$            | $\lambda^{-3} + \mu_0$                               | $0 < \mathbf{c}_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(\mathbf{c}_{0\dots v3} \in \{\mathbf{c}_3^{\text{def}}\}) =$ | $\mathbf{T}$ | $\uparrow$                        |              |
| $\mathbf{d}_{0\dots v3} = 1 - \mathbf{c}_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} + \mu_0$ | $\lambda^{-2} < \mathbf{d}_3^{\text{def}} < 1$  | $\Rightarrow t(\mathbf{d}_{0\dots v3} \in \{\mathbf{d}_3^{\text{def}}\}) =$ | $\mathbf{T}$ | $\uparrow$                        |              |

|                                                 |                                        |                                                      |                                                           |   |              |
|-------------------------------------------------|----------------------------------------|------------------------------------------------------|-----------------------------------------------------------|---|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$  | $\Leftarrow$                                         | $t_k(Q_{0\dots v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - b_{0\dots v} =$            | $1 - \lambda^{-3} - \mu_0$             | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =$ | $2\lambda^{-1} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =$ |                                        | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0\dots v4} = 1 - a_{0\dots v} =$            |                                        | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                                 |                                       |                                       |                                                           |   |              |
|-------------------------------------------------|---------------------------------------|---------------------------------------|-----------------------------------------------------------|---|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ | $\Leftarrow$                          | $t_k(Q_{0\dots v1}) =$                                    | F | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $\lambda^{-1} - \mu_0$                | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $2\lambda^{-2} - \mu_0$               | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ | $-\lambda^{-3} + \mu_0$               | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ | F | $\uparrow$   |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            |                                       | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                                 |                                       |                                                      |                                                           |   |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|---|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ | $\Leftarrow$                                         | $t_k(Q_{0\dots v2}) =$                                    | F | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | F | $\uparrow$   |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ |                                       | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ |   | $\uparrow$   |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ |                                       | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            |                                       | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                             |                                            |                                         |                                                           |                        |            |              |
|---------------------------------------------|--------------------------------------------|-----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{04332432433312332133}$ <i>verified</i> |                                         | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $1 - \lambda^{-3} - \mu_0$                 | $\lambda^{-2} < a_3^{\text{def}} < 1$   | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-3} - \mu_0$      | $0 < b_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $\lambda^{-2} + \lambda^{-3} + \mu_0$      | $0 < c_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ | $2 \lambda^{-1} - \mu_0$                   | $\lambda^{-1} < d_3^{\text{def}} < 1$   | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                  |                                       |                                                      |                                                           |   |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|---|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ | $\Leftarrow$                                         | $t_k(Q_{0\dots v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             | $\lambda^{-1} - \mu_0$                | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ | $-2\lambda^{-2} + \mu_0$              | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  |                                       | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|                  |                                       |                      |                                              |   |              |
|------------------|---------------------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{04332432433312332133}$            | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $1 - \lambda^{-3} - \mu_0$            |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-3} - \mu_0$ |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$ |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $2 \lambda^{-1} - \mu_0$              |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =$  | $-\lambda^{-3} + \mu_0$               | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =$ |                                       | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v2} = 1 - d_{0\dots v} =$             |                                       | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - a_{0\dots v} =$             |                                       | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                         |                                         |                                                           |                        |            |              |
|---------------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{043324324333123321333}$             | verified                                | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = \sqrt{2} - d_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \mu_0$   | $\lambda^{-1} < a_3^{\text{def}} < 1$   | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = 1 - a_{0\dots v} =$        | $\lambda^{-3} + \mu_0$                  | $0 < b_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = b_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-3} - \mu_0$   | $0 < c_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = 1 - c_{0\dots v} =$        | $\lambda^{-1} + 2 \lambda^{-2} - \mu_0$ | $\lambda^{-2} < d_3^{\text{def}} < 1$   | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                                      |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$                |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - b_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} + \mu_0$ | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =$ |                                                      | $\lambda^{-1} < b_4^{\text{def}} < 2 \lambda^{-1}$   | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =$ |                                                      | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v4} = 1 - a_{0\dots v} =$            |                                                      | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                 |                                       |                                       |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|---------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                       | $\Leftarrow$                                              | $t_k(Q_{0\dots v1}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $\lambda^{-3} + \mu_0$                | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $-\lambda^{-3} + \mu_0$               | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ |                                       | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            |                                       | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                 |                                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|-------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$                 |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$  | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ | $-\lambda^{-1} - \lambda^{-3} - \lambda^{-4} + \mu_0$ | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ |                                                       | $\lambda^{-1} < c_2^{\text{def}} < 2 \lambda^{-1}$   | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            |                                                       | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                                      |                                         |                                                           |                        |            |              |
|---------------------------------------------|------------------------------------------------------|-----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{043324324333123321333}$                          | verified                                | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} + \mu_0$ | $\lambda^{-2} < a_3^{\text{def}} < 1$   | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $\lambda^{-2} + \lambda^{-3} + \mu_0$                | $0 < b_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $\lambda^{-2} + \mu_0$                               | $0 < c_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-3} + \mu_0$                | $\lambda^{-1} < d_3^{\text{def}} < 1$   | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                  |                             |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|-----------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | $Q_{043324324333123321334}$ | verified                                             | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $\lambda^{-2} + \mu_0$      | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             | $\lambda^{-3} + \mu_0$      | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ | $\lambda^{-3} - \mu_0$      | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  | $\lambda^{-2} - \mu_0$      | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|               |                             |                      |                                           |   |              |
|---------------|-----------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{043324324333123321334}$ | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $\lambda^{-2} + \mu_0$      |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-3} + \mu_0$      |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\lambda^{-3} - \mu_0$      |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $\lambda^{-2} - \mu_0$      |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                                    |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $2\lambda^{-2} - \mu_0$            | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $-2\lambda^{-2} - \mu_0$           | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             |                                    | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             |                                    | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                           |                                        |                                                        |                     |            |              |
|---------------------------------------|-------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | Forbidden successor of $Q_{0...v}$        |                                        | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | F          | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $1 + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v3} = 1 - a_{0...v} =$        |                                           | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v3} = b_{0...v} =$            |                                           | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v3} = 1 - c_{0...v} =$        |                                           | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                           |                                       |                                                      |                                                        |                     |            |              |
|-------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | $Q_{0433243243331233213344}$          | verified                                             | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | T          | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $1 - \lambda^{-3} - \mu_0$            | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v4} = 1 - a_{0...v} =$            | $2\lambda^{-1} - \mu_0$               | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                              |                                       |                                                        |                     |            |              |
|-------------------------------------------|------------------------------|---------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | $Q_{0433243243331233213341}$ | verified                              | $\Leftarrow$                                           | $t_k(Q_{0...v1}) =$ | T          | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $2\lambda^{-1} - \mu_0$      | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $2\lambda^{-2} - \mu_0$      | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $2\lambda^{-2} + \mu_0$      | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v1} = 1 - d_{0...v} =$            | $2\lambda^{-1} + \mu_0$      | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                       |                                                      |                                                        |                     |            |              |
|-------------------------------------------|---------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | $Q_{0433243243331233213342}$          | verified                                             | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | T          | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $2\lambda^{-1} + \mu_0$               | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ | $\lambda^{-1} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v2} = 1 - c_{0...v} =$            | $1 - \lambda^{-3} + \mu_0$            | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                       |                                    |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | Forbidden successor of $Q_{0...v}$ |                                        | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | F          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v} =$        | $1 - \lambda^{-3} - \mu_0$         | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v} =$            | $\lambda^{-3} + \mu_0$             | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v} =$        | $2\lambda^{-1} + \mu_0$            | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v} =$ |                                    | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                            |                                    |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | F          | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $2\lambda^{-1} + \mu_0$            | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v4} = 1 - a_{0...v} =$             |                                    | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ |                                    | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                    | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |



|               |                                       |                      |                                           |   |              |
|---------------|---------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{0433243243331233213342}$          | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $2\lambda^{-1} + \mu_0$               |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} - \mu_0$ |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\lambda^{-1} + \lambda^{-3} + \mu_0$ |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $1 - \lambda^{-3} + \mu_0$            |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                               |                                                      |                                                        |                     |            |              |
|--------------------------------------------|-------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | $Q_{04332432433312332133422}$ | verified                                             | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | T          | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $\lambda^{-2} + \mu_0$        | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $\lambda^{-3} + \mu_0$        | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             | $\lambda^{-3} - \mu_0$        | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             | $\lambda^{-2} - \mu_0$        | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                       |                                                      |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{04332432433312332133423}$                        | verified                               | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $\lambda^{-1} + \lambda^{-3} - \mu_0$                | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = 1 - a_{0...v} =$        | $\lambda^{-2} - \mu_0$                               | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = b_{0...v} =$            | $\lambda^{-2} + \lambda^{-3} + \mu_0$                | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = 1 - c_{0...v} =$        | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} - \mu_0$ | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                        |                                                      |                                                        |   |              |  |
|-------------------------------------------|----------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|--|
| $Q_{0...v4} = h_4(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$     | $\Leftarrow$                                         | $t_k(Q_{0...v4}) =$                                    | F | $\Leftarrow$ |  |
| $a_{0...v4} = 1 - b_{0...v} =$            | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$ | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |  |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $2\lambda^{-1} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | F | $\uparrow$   |  |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ |                                        | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |   | $\uparrow$   |  |
| $d_{0...v4} = 1 - a_{0...v} =$            |                                        | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |  |

|                                           |                                    |                                       |                                                        |   |              |  |
|-------------------------------------------|------------------------------------|---------------------------------------|--------------------------------------------------------|---|--------------|--|
| $Q_{0...v1} = h_1(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                          | $t_k(Q_{0...v1}) =$                                    | F | $\Leftarrow$ |  |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-2} - \mu_0$             | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T | $\uparrow$   |  |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $\lambda^{-2} + \mu_0$             | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T | $\uparrow$   |  |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $-\lambda^{-3} - \mu_0$            | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | F | $\uparrow$   |  |
| $d_{0...v1} = 1 - d_{0...v} =$            |                                    | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ |   | $\uparrow$   |  |

|                                           |                                    |                                                      |                                                        |   |              |  |
|-------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|--|
| $Q_{0...v2} = h_2(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                                         | $t_k(Q_{0...v2}) =$                                    | F | $\Leftarrow$ |  |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\lambda^{-3} - \mu_0$             | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | F | $\uparrow$   |  |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ |                                    | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ |   | $\uparrow$   |  |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ |                                    | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |   | $\uparrow$   |  |
| $d_{0...v2} = 1 - c_{0...v} =$            |                                    | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |   | $\uparrow$   |  |

|                                       |                                        |                                        |                                                        |                     |            |              |
|---------------------------------------|----------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{04332432433312332133423}$          | verified                               | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v} =$        | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$ | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v} =$            | $\lambda^{-1} + \lambda^{-3} + \mu_0$  | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v} =$        | $\lambda^{-3} - \mu_0$                 | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$  | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                            |                                    |                                                      |                                                        |   |              |  |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---|--------------|--|
| $Q_{0...v4} = h_4(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ | $\Leftarrow$                                         | $t_k(Q_{0...v4}) =$                                    | F | $\Leftarrow$ |  |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\lambda^{-3} - \mu_0$             | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |  |
| $b_{0...v4} = 1 - a_{0...v} =$             | $\lambda^{-2} - \mu_0$             | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T | $\uparrow$   |  |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ | $-\lambda^{-2} - \mu_0$            | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | F | $\uparrow$   |  |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                    | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |  |

|                  |                                        |                      |                                              |   |              |
|------------------|----------------------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{04332432433312332133423}$          | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$ |                      | $t(a_{0\dots v}) \in \{a_v^{\text{def}}\} =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-3} + \mu_0$  |                      | $t(b_{0\dots v}) \in \{b_v^{\text{def}}\} =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\lambda^{-3} - \mu_0$                 |                      | $t(c_{0\dots v}) \in \{c_v^{\text{def}}\} =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$  |                      | $t(d_{0\dots v}) \in \{d_v^{\text{def}}\} =$ | T | $\uparrow$   |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =$  | $-\lambda^{-3} - \mu_0$               | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v2}) \in \{a_2^{\text{def}}\} =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =$ |                                       | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2}) \in \{b_2^{\text{def}}\} =$ |                        | $\uparrow$ |              |
| $c_{0\dots v2} = 1 - d_{0\dots v} =$             |                                       | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v2}) \in \{c_2^{\text{def}}\} =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - a_{0\dots v} =$             |                                       | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v2}) \in \{d_2^{\text{def}}\} =$ |                        | $\uparrow$ |              |

|                                             |                                       |                                        |                                                           |                        |            |              |
|---------------------------------------------|---------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{043324324333123321334233}$        | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = \sqrt{2} - d_{0\dots v} =$ | $2\lambda^{-1} + \mu_0$               | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3}) \in \{a_3^{\text{def}}\} =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = 1 - a_{0\dots v} =$        | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3}) \in \{b_3^{\text{def}}\} =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = b_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-3} + \mu_0$ | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3}) \in \{c_3^{\text{def}}\} =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = 1 - c_{0\dots v} =$        | $1 - \lambda^{-3} + \mu_0$            | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3}) \in \{d_3^{\text{def}}\} =$ | T                      | $\uparrow$ |              |

|                                                 |                                                      |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$                |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - b_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} + \mu_0$ | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v4}) \in \{a_4^{\text{def}}\} =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =$ |                                                      | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0\dots v4}) \in \{b_4^{\text{def}}\} =$ |                        | $\uparrow$ |              |
| $c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =$ |                                                      | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4}) \in \{c_4^{\text{def}}\} =$ |                        | $\uparrow$ |              |
| $d_{0\dots v4} = 1 - a_{0\dots v} =$            |                                                      | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v4}) \in \{d_4^{\text{def}}\} =$ |                        | $\uparrow$ |              |

|                                                 |                                       |                                       |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|---------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                       | $\Leftarrow$                                              | $t_k(Q_{0\dots v1}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1}) \in \{a_1^{\text{def}}\} =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $-\lambda^{-3} - \mu_0$               | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1}) \in \{b_1^{\text{def}}\} =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ |                                       | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1}) \in \{c_1^{\text{def}}\} =$ |                        | $\uparrow$ |              |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            |                                       | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1}) \in \{d_1^{\text{def}}\} =$ |                        | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $\lambda^{-1} + \mu_0$                | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2}) \in \{a_2^{\text{def}}\} =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ | $-2\lambda^{-2} - \mu_0$              | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2}) \in \{b_2^{\text{def}}\} =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ |                                       | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0\dots v2}) \in \{c_2^{\text{def}}\} =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            |                                       | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2}) \in \{d_2^{\text{def}}\} =$ |                        | $\uparrow$ |              |

|                                             |                                                      |                                        |                                                           |                        |            |              |
|---------------------------------------------|------------------------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{043324324333123321334233}$                       | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-3} + \lambda^{-4} - \mu_0$ | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3}) \in \{a_3^{\text{def}}\} =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $\lambda^{-3} - \mu_0$                               | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3}) \in \{b_3^{\text{def}}\} =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $\lambda^{-1} + \mu_0$                               | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3}) \in \{c_3^{\text{def}}\} =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3}) \in \{d_3^{\text{def}}\} =$ | T                      | $\uparrow$ |              |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | $Q_{043324324333123321334234}$        | verified                                             | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $\lambda^{-1} + \mu_0$                | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4}) \in \{a_4^{\text{def}}\} =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4}) \in \{b_4^{\text{def}}\} =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ | $\lambda^{-3} + \mu_0$                | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4}) \in \{c_4^{\text{def}}\} =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  | $2\lambda^{-2} + \mu_0$               | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4}) \in \{d_4^{\text{def}}\} =$ | T                      | $\uparrow$ |              |

|               |                                       |                      |                                           |   |              |
|---------------|---------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{043324324333123321334234}$        | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $\lambda^{-1} + \mu_0$                |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} - \mu_0$ |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\lambda^{-3} + \mu_0$                |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $2\lambda^{-2} + \mu_0$               |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                                    |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $\lambda^{-2} + \mu_0$             | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $-2\lambda^{-3} + \mu_0$           | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             |                                    | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             |                                    | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                    |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | Forbidden successor of $Q_{0...v}$ |                                        | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | F          | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $1 + \lambda^{-3} - \mu_0$         | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v3} = 1 - a_{0...v} =$        |                                    | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v3} = b_{0...v} =$            |                                    | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v3} = 1 - c_{0...v} =$        |                                    | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                           |                                        |                                                      |                                                        |                     |            |              |
|-------------------------------------------|----------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | $Q_{0433243243331233213342344}$        | verified                                             | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | T          | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$ | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $\lambda^{-1} + \lambda^{-3} + \mu_0$  | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ | $\lambda^{-3} - \mu_0$                 | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v4} = 1 - a_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} - \mu_0$  | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                                      |                                       |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------------------------|---------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | $Q_{0433243243331233213342341}$                      | verified                              | $\Leftarrow$                                           | $t_k(Q_{0...v1}) =$ | T          | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} - \mu_0$                | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $\lambda^{-2} + \mu_0$                               | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $2\lambda^{-2} - \mu_0$                              | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v1} = 1 - d_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                                      |                                                      |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | Forbidden successor of $Q_{0...v}$                   |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ | $-\mu_0$                                             | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ |                                                      | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - c_{0...v} =$            |                                                      | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                                      |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | $Q_{0433243243331233213342343}$                      | verified                               | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | T          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v} =$        | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$               | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v} =$            | $\lambda^{-3} + \mu_0$                               | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v} =$        | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v} =$ | $1 - \mu_0$                                          | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                            |                                                      |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$                   |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | F          | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v4} = 1 - a_{0...v} =$             |                                                      | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ |                                                      | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                                      | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                  |                                                      |                      |                                              |   |              |
|------------------|------------------------------------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{0433243243331233213342343}$                      | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$               |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\lambda^{-3} + \mu_0$                               |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $1 - \mu_0$                                          |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                  |                                                  |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|--------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$              | $Q_{04332432433312332133423432}$ <i>verified</i> |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =$  | $2\lambda^{-2} - \mu_0$                          | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =$ | $\lambda^{-2} + \lambda^{-3} - \mu_0$            | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v2} = 1 - d_{0\dots v} =$             | $\mu_0$                                          | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - a_{0\dots v} =$             | $\lambda^{-2} + \lambda^{-3} - \mu_0$            | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                             |                                                  |                                        |                                                           |                          |              |
|---------------------------------------------|--------------------------------------------------|----------------------------------------|-----------------------------------------------------------|--------------------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{04332432433312332133423433}$ <i>verified</i> |                                        | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) = T$ | $\Leftarrow$ |
| $a_{0\dots v3} = \sqrt{2} - d_{0\dots v} =$ | $\lambda^{-1} + \mu_0$                           | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                        | $\uparrow$   |
| $b_{0\dots v3} = 1 - a_{0\dots v} =$        | $\lambda^{-2} + \lambda^{-3} - \mu_0$            | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                        | $\uparrow$   |
| $c_{0\dots v3} = b_{0\dots v} =$            | $\lambda^{-3} + \mu_0$                           | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                        | $\uparrow$   |
| $d_{0\dots v3} = 1 - c_{0\dots v} =$        | $2\lambda^{-2} + \mu_0$                          | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                        | $\uparrow$   |

|                                                 |                                       |                                                      |                                                           |   |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|---|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ | $\Leftarrow$                                         | $t_k(Q_{0\dots v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - b_{0\dots v} =$            | $1 - \lambda^{-3} - \mu_0$            | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =$ | $1 + \lambda^{-3} - \mu_0$            | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =$ |                                       | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0\dots v4} = 1 - a_{0\dots v} =$            |                                       | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                                 |                                        |                                       |                                                           |   |              |
|-------------------------------------------------|----------------------------------------|---------------------------------------|-----------------------------------------------------------|---|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$  | $\Leftarrow$                          | $t_k(Q_{0\dots v1}) =$                                    | F | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-3} - \mu_0$  | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $2\lambda^{-2} - \mu_0$                | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ | $-\lambda^{-2} - \lambda^{-3} + \mu_0$ | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ | F | $\uparrow$   |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            |                                        | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                                 |                                       |                                                      |                                                           |   |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|---|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ | $\Leftarrow$                                         | $t_k(Q_{0\dots v2}) =$                                    | F | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $\mu_0$                               | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ | $-2\lambda^{-2} - \mu_0$              | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | F | $\uparrow$   |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ |                                       | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |   | $\uparrow$   |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            |                                       | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |   | $\uparrow$   |

|                                             |                                                      |                                         |                                                           |                        |            |              |
|---------------------------------------------|------------------------------------------------------|-----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{04332432433312332133423433}$ <i>verified</i>     |                                         | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $1 - \lambda^{-3} - \mu_0$                           | $\lambda^{-2} < a_3^{\text{def}} < 1$   | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < b_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $\mu_0$                                              | $0 < c_3^{\text{def}} < 2 \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < d_3^{\text{def}} < 1$   | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                  |                                       |                                                      |                                                           |   |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|---|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ | $\Leftarrow$                                         | $t_k(Q_{0\dots v4}) =$                                    | F | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $\mu_0$                               | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ | $-2\lambda^{-2} + \mu_0$              | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | F | $\uparrow$   |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  |                                       | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |   | $\uparrow$   |

|               |                                       |                      |                                           |   |              |
|---------------|---------------------------------------|----------------------|-------------------------------------------|---|--------------|
| $Q_{0...v} =$ | $Q_{04332432433312332133423432}$      | Verified predecessor | $t_v(Q_{0...v}) =$                        | T | $\Leftarrow$ |
| $a_{0...v} =$ | $2\lambda^{-2} - \mu_0$               |                      | $t(a_{0...v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} - \mu_0$ |                      | $t(b_{0...v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0...v} =$ | $\mu_0$                               |                      | $t(c_{0...v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0...v} =$ | $\lambda^{-2} + \lambda^{-3} - \mu_0$ |                      | $t(d_{0...v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                            |                                    |                                                      |                                                        |                     |            |              |
|--------------------------------------------|------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$ |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | F          | $\Leftarrow$ |
| $a_{0...v2} = \lambda^{-1} - b_{0...v} =$  | $\lambda^{-2} + \mu_0$             | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = -\lambda^{-1} + c_{0...v} =$ | $-\lambda^{-1} + \mu_0$            | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $c_{0...v2} = 1 - d_{0...v} =$             |                                    | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v2} = 1 - a_{0...v} =$             |                                    | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                       |                                    |                                        |                                                        |                     |            |              |
|---------------------------------------|------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | Forbidden successor of $Q_{0...v}$ |                                        | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | F          | $\Leftarrow$ |
| $a_{0...v3} = \sqrt{2} - d_{0...v} =$ | $1 + \lambda^{-2} + \mu_0$         | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v3} = 1 - a_{0...v} =$        |                                    | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v3} = b_{0...v} =$            |                                    | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v3} = 1 - c_{0...v} =$        |                                    | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                                           |                                                      |                                                      |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$             | $Q_{043324324333123321334234324}$                    | verified                                             | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | T          | $\Leftarrow$ |
| $a_{0...v4} = 1 - b_{0...v} =$            | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$               | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v4} = \lambda^{-1} + c_{0...v} =$ | $\lambda^{-1} + \mu_0$                               | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v4} = \lambda^{-1} - d_{0...v} =$ | $\lambda^{-2} + \mu_0$                               | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v4} = 1 - a_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                                      |                                       |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------------------------|---------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v1} = h_1(Q_{0...v})$             | $Q_{043324324333123321334234321}$                    | verified                              | $\Leftarrow$                                           | $t_k(Q_{0...v1}) =$ | T          | $\Leftarrow$ |
| $a_{0...v1} = 1 - a_{0...v} =$            | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0...v1} \in \{a_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v1} = \lambda^{-1} - b_{0...v} =$ | $\lambda^{-2} + \mu_0$                               | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0...v1} \in \{b_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v1} = \lambda^{-1} - c_{0...v} =$ | $\lambda^{-1} - \mu_0$                               | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0...v1} \in \{c_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v1} = 1 - d_{0...v} =$            | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$               | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0...v1} \in \{d_1^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                           |                                                      |                                                      |                                                        |                     |            |              |
|-------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v2} = h_2(Q_{0...v})$             | $Q_{043324324333123321334234322}$                    | verified                                             | $\Leftarrow$                                           | $t_k(Q_{0...v2}) =$ | T          | $\Leftarrow$ |
| $a_{0...v2} = 1 - d_{0...v} =$            | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$               | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0...v2} \in \{a_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v2} = \lambda^{-1} - a_{0...v} =$ | $\lambda^{-3} + \mu_0$                               | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v2} \in \{b_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v2} = \lambda^{-1} + b_{0...v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0...v2} \in \{c_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v2} = 1 - c_{0...v} =$            | $1 - \mu_0$                                          | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0...v2} \in \{d_2^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |

|                                       |                                        |                                        |                                                        |                     |            |              |
|---------------------------------------|----------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v3} = h_3(Q_{0...v})$         | Forbidden successor of $Q_{0...v}$     |                                        | $\Leftarrow$                                           | $t_k(Q_{0...v3}) =$ | F          | $\Leftarrow$ |
| $a_{0...v3} = 1 - b_{0...v} =$        | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$ | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0...v3} \in \{a_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $b_{0...v3} = c_{0...v} =$            | $\mu_0$                                | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0...v3} \in \{b_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $c_{0...v3} = 1 - d_{0...v} =$        | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$ | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0...v3} \in \{c_3^{\text{def}}\}) =$ | T                   | $\uparrow$ |              |
| $d_{0...v3} = \sqrt{2} - a_{0...v} =$ | $1 + \lambda^{-3} + \mu_0$             | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0...v3} \in \{d_3^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |

|                                            |                                        |                                                      |                                                        |                     |            |              |
|--------------------------------------------|----------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------|------------|--------------|
| $Q_{0...v4} = h_4(Q_{0...v})$              | Forbidden successor of $Q_{0...v}$     |                                                      | $\Leftarrow$                                           | $t_k(Q_{0...v4}) =$ | F          | $\Leftarrow$ |
| $a_{0...v4} = 1 - d_{0...v} =$             | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$ | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0...v4} \in \{a_4^{\text{def}}\}) =$ | F                   | $\uparrow$ |              |
| $b_{0...v4} = 1 - a_{0...v} =$             |                                        | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0...v4} \in \{b_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $c_{0...v4} = -\lambda^{-1} + b_{0...v} =$ |                                        | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0...v4} \in \{c_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |
| $d_{0...v4} = \lambda^{-1} - c_{0...v} =$  |                                        | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0...v4} \in \{d_4^{\text{def}}\}) =$ |                     | $\uparrow$ |              |

|                  |                                                      |                      |                                              |   |              |
|------------------|------------------------------------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{043324324333123321334234321}$                    | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\lambda^{-2} + \mu_0$                               |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\lambda^{-1} - \mu_0$                               |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$               |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =$  | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =$ | $-\mu_0$                              | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v2} = 1 - d_{0\dots v} =$             |                                       | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - a_{0\dots v} =$             |                                       | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                                      |                                        |                                                           |                        |            |              |
|---------------------------------------------|------------------------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{0433243243331233213342343213}$                   | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = \sqrt{2} - d_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = 1 - a_{0\dots v} =$        | $2\lambda^{-2} - \mu_0$                              | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = b_{0\dots v} =$            | $\lambda^{-2} + \mu_0$                               | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = 1 - c_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-2} + \mu_0$                | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - b_{0\dots v} =$            | $2\lambda^{-1} - \mu_0$               | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =$ | $2\lambda^{-1} + \mu_0$               | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =$ |                                       | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v4} = 1 - a_{0\dots v} =$            |                                       | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                 |                                       |                                       |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|---------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | $Q_{0433243243331233213342343211}$    | verified                              | $\Leftarrow$                                              | $t_k(Q_{0\dots v1}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $2\lambda^{-2} - \mu_0$               | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ | $\mu_0$                               | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ |                                       | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ |                                       | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            |                                       | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                        |                                        |                                                           |                        |            |              |
|---------------------------------------------|----------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{0433243243331233213342343213}$     | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $2\lambda^{-1} - \mu_0$                | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $\lambda^{-1} - \mu_0$                 | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $\lambda^{-2} + \lambda^{-3} - \mu_0$  | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$ | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                  |                                        |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|----------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$  |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $\lambda^{-2} + \lambda^{-3} - \mu_0$  | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             | $2\lambda^{-2} - \mu_0$                | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ | $-\lambda^{-2} - \lambda^{-3} + \mu_0$ | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  |                                        | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                  |                                        |                      |                                              |   |              |
|------------------|----------------------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{0433243243331233213342343213}$     | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $2\lambda^{-1} - \mu_0$                |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\lambda^{-1} - \mu_0$                 |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\lambda^{-2} + \lambda^{-3} - \mu_0$  |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$ |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

| $Q_{0\dots v2} = h_2(Q_{0\dots v})$                       | Forbidden successor of $Q_{0\dots v}$ |                                                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F | $\Leftarrow$ |
|-----------------------------------------------------------|---------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------|------------------------|---|--------------|
| $\mathbf{a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =}$  | $\mu_0$                               | $\mathbf{0 < a_2^{\text{def}} < \lambda^{-1}}$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | <b>T</b>               |   | $\uparrow$   |
| $\mathbf{b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =}$ | $-2\lambda^{-2} - \mu_0$              | $\mathbf{0 < b_2^{\text{def}} < \lambda^{-1}}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | <b>F</b>               |   | $\uparrow$   |
| $\mathbf{c_{0\dots v2} = 1 - d_{0\dots v} =}$             |                                       | $\mathbf{0 < c_2^{\text{def}} < \lambda^{-1}}$                | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        |   | $\uparrow$   |
| $\mathbf{d_{0\dots v2} = 1 - a_{0\dots v} =}$             |                                       | $\mathbf{0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}}$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        |   | $\uparrow$   |

|                                                               |                                                      |                                                 |                                                                             |                                   |              |
|---------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$                           | $Q_{04332432433312332133423432133}$ <i>verified</i>  |                                                 | $\Leftarrow$                                                                | $t_k(Q_{0\dots v3}) = \mathbf{T}$ | $\Leftarrow$ |
| $\mathbf{a}_{0\dots v3} = \sqrt{2} - \mathbf{d}_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < \mathbf{a}_3^{\text{def}} < 1$  | $\Rightarrow t(\mathbf{a}_{0\dots v3} \in \{\mathbf{a}_3^{\text{def}}\}) =$ | $\mathbf{T}$                      | $\uparrow$   |
| $\mathbf{b}_{0\dots v3} = 1 - \mathbf{a}_{0\dots v} =$        | $\lambda^{-2} + \mu_0$                               | $0 < \mathbf{b}_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(\mathbf{b}_{0\dots v3} \in \{\mathbf{b}_3^{\text{def}}\}) =$ | $\mathbf{T}$                      | $\uparrow$   |
| $\mathbf{c}_{0\dots v3} = \mathbf{b}_{0\dots v} =$            | $\lambda^{-1} - \mu_0$                               | $0 < \mathbf{c}_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(\mathbf{c}_{0\dots v3} \in \{\mathbf{c}_3^{\text{def}}\}) =$ | $\mathbf{T}$                      | $\uparrow$   |
| $\mathbf{d}_{0\dots v3} = 1 - \mathbf{c}_{0\dots v} =$        | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$               | $\lambda^{-2} < \mathbf{d}_3^{\text{def}} < 1$  | $\Rightarrow t(\mathbf{d}_{0\dots v3} \in \{\mathbf{d}_3^{\text{def}}\}) =$ | $\mathbf{T}$                      | $\uparrow$   |

| $Q_{0\dots v4} = h_4(Q_{0\dots v})$                      | Forbidden successor of $Q_{0\dots v}$                |                                                                        | $\Leftarrow$                                                                | $t_k(Q_{0\dots v4}) =$ | F | $\Leftarrow$ |
|----------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------|---|--------------|
| $\mathbf{a_{0\dots v4} = 1 - b_{0\dots v} =}$            | $\lambda^{-1} + \lambda^{-2} + \mu_0$                | $\lambda^{-1} + \lambda^{-2} < \mathbf{a_4^{\text{def}}} < \mathbf{1}$ | $\Rightarrow t(\mathbf{a_{0\dots v4}} \in \{\mathbf{a_4^{\text{def}}}\}) =$ | <b>T</b>               |   | $\uparrow$   |
| $\mathbf{b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =}$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} - \mu_0$ | $\lambda^{-1} < \mathbf{b_4^{\text{def}}} < 2 \lambda^{-1}$            | $\Rightarrow t(\mathbf{b_{0\dots v4}} \in \{\mathbf{b_4^{\text{def}}}\}) =$ | <b>T</b>               |   | $\uparrow$   |
| $\mathbf{c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =}$ | $-2 \lambda^{-2} + \mu_0$                            | $\mathbf{0} < \mathbf{c_4^{\text{def}}} < \lambda^{-1}$                | $\Rightarrow t(\mathbf{c_{0\dots v4}} \in \{\mathbf{c_4^{\text{def}}}\}) =$ | <b>F</b>               |   | $\uparrow$   |
| $\mathbf{d_{0\dots v4} = 1 - a_{0\dots v} =}$            |                                                      | $\lambda^{-1} < \mathbf{d_4^{\text{def}}} < \mathbf{1}$                | $\Rightarrow t(\mathbf{d_{0\dots v4}} \in \{\mathbf{d_4^{\text{def}}}\}) =$ |                        |   | $\uparrow$   |

|                                                 |                                                     |                                       |                                                           |                          |              |
|-------------------------------------------------|-----------------------------------------------------|---------------------------------------|-----------------------------------------------------------|--------------------------|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | $Q_{04332432433312332133423432131}$ <i>verified</i> |                                       | $\Leftarrow$                                              | $t_k(Q_{0\dots v1}) =$ T | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $\lambda^{-2} + \mu_0$                              | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T                        | $\uparrow$   |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $\mu_0$                                             | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | T                        | $\uparrow$   |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ | $\lambda^{-2} + \mu_0$                              | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ | T                        | $\uparrow$   |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            | $\lambda^{-2} + \lambda^{-3} + \mu_0$               | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ | T                        | $\uparrow$   |

| $Q_{0\dots v2} = h_2(Q_{0\dots v})$                               | Forbidden successor of $Q_{0\dots v}$ |                                                               | $\Leftarrow$                                                                | $t_k(Q_{0\dots v2}) =$ | F | $\Leftarrow$ |
|-------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------|---|--------------|
| $\mathbf{a}_{0\dots v2} = 1 - \mathbf{d}_{0\dots v} =$            | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < \mathbf{a}_2^{\text{def}} < 1$                | $\Rightarrow t(\mathbf{a}_{0\dots v2} \in \{\mathbf{a}_2^{\text{def}}\}) =$ | F                      |   | $\uparrow$   |
| $\mathbf{b}_{0\dots v2} = \lambda^{-1} - \mathbf{a}_{0\dots v} =$ |                                       | $0 < \mathbf{b}_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(\mathbf{b}_{0\dots v2} \in \{\mathbf{b}_2^{\text{def}}\}) =$ |                        |   | $\uparrow$   |
| $\mathbf{c}_{0\dots v2} = \lambda^{-1} + \mathbf{b}_{0\dots v} =$ |                                       | $\lambda^{-1} < \mathbf{c}_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(\mathbf{c}_{0\dots v2} \in \{\mathbf{c}_2^{\text{def}}\}) =$ |                        |   | $\uparrow$   |
| $\mathbf{d}_{0\dots v2} = 1 - \mathbf{c}_{0\dots v} =$            |                                       | $\lambda^{-1} + \lambda^{-2} < \mathbf{d}_2^{\text{def}} < 1$ | $\Rightarrow t(\mathbf{d}_{0\dots v2} \in \{\mathbf{d}_2^{\text{def}}\}) =$ |                        |   | $\uparrow$   |

| $Q_{0\dots v3} = h_3(Q_{0\dots v})$                             | $Q_{04332432433312332133423432133}$ <i>verified</i> |                                                          | $\Leftarrow$                                                                | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
|-----------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------|------------------------|------------|--------------|
| $\mathbf{a}_{0\dots v3} = \mathbf{1} - \mathbf{b}_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \mu_0$               | $\lambda^{-2} < \mathbf{a}_3^{\text{def}} < 1$           | $\Rightarrow t(\mathbf{a}_{0\dots v3} \in \{\mathbf{a}_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $\mathbf{b}_{0\dots v3} = \mathbf{c}_{0\dots v} =$              | $\lambda^{-2} + \lambda^{-3} - \mu_0$               | $\mathbf{0} < \mathbf{b}_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(\mathbf{b}_{0\dots v3} \in \{\mathbf{b}_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $\mathbf{c}_{0\dots v3} = \mathbf{1} - \mathbf{d}_{0\dots v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$               | $\mathbf{0} < \mathbf{c}_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(\mathbf{c}_{0\dots v3} \in \{\mathbf{c}_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $\mathbf{d}_{0\dots v3} = \sqrt{2} - \mathbf{a}_{0\dots v} =$   | $\lambda^{-1} + \lambda^{-2} + \mu_0$               | $\lambda^{-1} < \mathbf{d}_3^{\text{def}} < 1$           | $\Rightarrow t(\mathbf{d}_{0\dots v3} \in \{\mathbf{d}_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

| $Q_{0\dots v4} = h_4(Q_{0\dots v})$                                | Forbidden successor of $Q_{0\dots v}$ |                                                                        | $\Leftarrow$                                                                | $t_k(Q_{0\dots v4}) =$ | F | $\Leftarrow$ |
|--------------------------------------------------------------------|---------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------|---|--------------|
| $\mathbf{a}_{0\dots v4} = \mathbf{1} - \mathbf{d}_{0\dots v} =$    | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $\mathbf{0} < \mathbf{a}_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(\mathbf{a}_{0\dots v4} \in \{\mathbf{a}_4^{\text{def}}\}) =$ | <b>T</b>               |   | $\uparrow$   |
| $\mathbf{b}_{0\dots v4} = \mathbf{1} - \mathbf{a}_{0\dots v} =$    | $\lambda^{-2} + \mu_0$                | $\mathbf{0} < \mathbf{b}_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(\mathbf{b}_{0\dots v4} \in \{\mathbf{b}_4^{\text{def}}\}) =$ | <b>T</b>               |   | $\uparrow$   |
| $\mathbf{c}_{0\dots v4} = -\lambda^{-1} + \mathbf{b}_{0\dots v} =$ | $-\mu_0$                              | $\mathbf{0} < \mathbf{c}_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(\mathbf{c}_{0\dots v4} \in \{\mathbf{c}_4^{\text{def}}\}) =$ | <b>F</b>               |   | $\uparrow$   |
| $\mathbf{d}_{0\dots v4} = \lambda^{-1} - \mathbf{c}_{0\dots v} =$  |                                       | $\mathbf{0} < \mathbf{d}_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(\mathbf{d}_{0\dots v4} \in \{\mathbf{d}_4^{\text{def}}\}) =$ |                        |   | $\uparrow$   |

|                  |                                       |                      |                                              |   |              |
|------------------|---------------------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{043324324333123321334234321333}$  | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \mu_0$ |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\lambda^{-2} + \lambda^{-3} - \mu_0$ |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$ |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \mu_0$ |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =$  | $\lambda^{-2} + \mu_0$                | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =$ | $-\lambda^{-2} + \mu_0$               | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v2} = 1 - d_{0\dots v} =$             |                                       | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - a_{0\dots v} =$             |                                       | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                        |                                        |                                                           |                        |            |              |
|---------------------------------------------|----------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{043324324333123321334234321333}$   | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = \sqrt{2} - d_{0\dots v} =$ | $2\lambda^{-1} - \mu_0$                | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = 1 - a_{0\dots v} =$        | $\lambda^{-1} - \mu_0$                 | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = b_{0\dots v} =$            | $\lambda^{-2} + \lambda^{-3} - \mu_0$  | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = 1 - c_{0\dots v} =$        | $\lambda^{-1} + 2\lambda^{-2} - \mu_0$ | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                                      |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$                |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - b_{0\dots v} =$            | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$               | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \lambda^{-3} + \mu_0$ | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =$ | $-\lambda^{-2} + \mu_0$                              | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $d_{0\dots v4} = 1 - a_{0\dots v} =$            |                                                      | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                 |                                      |                                       |                                                           |                        |            |              |
|-------------------------------------------------|--------------------------------------|---------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | $Q_{043324324333123321334234321331}$ | verified                              | $\Leftarrow$                                              | $t_k(Q_{0\dots v1}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $\lambda^{-1} - \mu_0$               | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $\lambda^{-2} + \mu_0$               | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ | $\lambda^{-2} - \mu_0$               | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            | $\lambda^{-1} - \mu_0$               | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $\lambda^{-1} - \mu_0$                | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ |                                       | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ |                                       | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            |                                       | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                        |                                        |                                                           |                        |            |              |
|---------------------------------------------|----------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{043324324333123321334234321333}$   | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $\lambda^{-1} + 2\lambda^{-2} + \mu_0$ | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $\lambda^{-2} + \lambda^{-3} + \mu_0$  | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $\lambda^{-1} - \mu_0$                 | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ | $2\lambda^{-1} - \mu_0$                | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $\lambda^{-1} - \mu_0$                | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             | $\lambda^{-1} - \mu_0$                | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ | $-\lambda^{-2} + \mu_0$               | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  |                                       | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |



|                  |                                      |                      |                                              |   |              |
|------------------|--------------------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{043324324333123321334234321331}$ | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $\lambda^{-1} - \mu_0$               |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\lambda^{-2} + \mu_0$               |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\lambda^{-2} - \mu_0$               |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $\lambda^{-1} - \mu_0$               |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                  |                                        |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|----------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$  |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =$  | $\lambda^{-2} + \lambda^{-3} - \mu_0$  | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =$ | $-\lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v2} = 1 - d_{0\dots v} =$             |                                        | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - a_{0\dots v} =$             |                                        | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                       |                                        |                                                           |                        |            |              |
|---------------------------------------------|---------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | Forbidden successor of $Q_{0\dots v}$ |                                        | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v3} = \sqrt{2} - d_{0\dots v} =$ | $1 + \mu_0$                           | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v3} = 1 - a_{0\dots v} =$        |                                       | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v3} = b_{0\dots v} =$            |                                       | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v3} = 1 - c_{0\dots v} =$        |                                       | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$             | $Q_{0433243243331233213342343213314}$ | verified                                             | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - b_{0\dots v} =$            | $2\lambda^{-1} - \mu_0$               | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =$ | $\mu_0$                               | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v4} = 1 - a_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                       |                                       |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|---------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | $Q_{0433243243331233213342343213311}$ | verified                              | $\Leftarrow$                                              | $t_k(Q_{0\dots v1}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $\lambda^{-2} + \lambda^{-3} - \mu_0$ | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ | $\lambda^{-2} + \lambda^{-3} + \mu_0$ | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | $Q_{0433243243331233213342343213312}$ | verified                                             | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ | $\mu_0$                               | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            | $2\lambda^{-2} + \mu_0$               | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                             |                                       |                                        |                                                           |                        |            |              |
|---------------------------------------------|---------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | Forbidden successor of $Q_{0\dots v}$ |                                        | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $\lambda^{-2} - \mu_0$                | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ | $1 + \mu_0$                           | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $\lambda^{-1} + \lambda^{-2} + \mu_0$ | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             |                                       | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ |                                       | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  |                                       | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                  |                                       |                      |                                              |   |              |
|------------------|---------------------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{0433243243331233213342343213314}$ | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $2\lambda^{-1} - \mu_0$               |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} - \mu_0$ |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\mu_0$                               |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \mu_0$ |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =$  | $-\lambda^{-2} + \mu_0$               | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =$ |                                       | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v2} = 1 - d_{0\dots v} =$             |                                       | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - a_{0\dots v} =$             |                                       | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                        |                                        |                                                           |                        |            |              |
|---------------------------------------------|----------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{04332432433312332133423432133143}$ | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = \sqrt{2} - d_{0\dots v} =$ | $2\lambda^{-1} - \mu_0$                | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = 1 - a_{0\dots v} =$        | $\lambda^{-2} + \mu_0$                 | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = b_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-2} - \mu_0$  | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = 1 - c_{0\dots v} =$        | $1 - \mu_0$                            | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - b_{0\dots v} =$            | $\lambda^{-2} + \mu_0$                | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =$ |                                       | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =$ |                                       | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v4} = 1 - a_{0\dots v} =$            |                                       | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                 |                                       |                                       |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|---------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                       | $\Leftarrow$                                              | $t_k(Q_{0\dots v1}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $\lambda^{-2} + \mu_0$                | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $-\lambda^{-2} + \mu_0$               | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ |                                       | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            |                                       | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $\lambda^{-1} - \mu_0$                | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ |                                       | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ |                                       | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            |                                       | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                        |                                        |                                                           |                        |            |              |
|---------------------------------------------|----------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{04332432433312332133423432133143}$ | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $\lambda^{-1} + \mu_0$                 | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $\mu_0$                                | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $\lambda^{-1} - \mu_0$                 | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \mu_0$  | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                  |                                        |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|----------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | $Q_{04332432433312332133423432133144}$ | verified                                             | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $\lambda^{-1} - \mu_0$                 | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             | $\lambda^{-2} + \mu_0$                 | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ | $\lambda^{-2} - \mu_0$                 | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  | $\lambda^{-1} - \mu_0$                 | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                  |                                        |                      |                                              |   |              |
|------------------|----------------------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{04332432433312332133423432133143}$ | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $\lambda^{-1} + \mu_0$                 |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\mu_0$                                |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\lambda^{-1} - \mu_0$                 |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $\lambda^{-1} + \lambda^{-2} + \mu_0$  |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =$  | $\lambda^{-1} - \mu_0$                | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =$ | $-\mu_0$                              | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v2} = 1 - d_{0\dots v} =$             |                                       | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - a_{0\dots v} =$             |                                       | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                         |                                        |                                                           |                        |            |              |
|---------------------------------------------|-----------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{043324324333123321334234321331433}$ | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = \sqrt{2} - d_{0\dots v} =$ | $2\lambda^{-1} - \mu_0$                 | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = 1 - a_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-2} - \mu_0$   | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = b_{0\dots v} =$            | $\mu_0$                                 | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = 1 - c_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-2} + \mu_0$   | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - b_{0\dots v} =$            | $1 - \mu_0$                           | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =$ | $2\lambda^{-1} - \mu_0$               | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =$ | $-\lambda^{-2} - \mu_0$               | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $d_{0\dots v4} = 1 - a_{0\dots v} =$            |                                       | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                 |                                         |                                       |                                                           |                        |            |              |
|-------------------------------------------------|-----------------------------------------|---------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | $Q_{043324324333123321334234321331431}$ | verified                              | $\Leftarrow$                                              | $t_k(Q_{0\dots v1}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-2} - \mu_0$   | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $\lambda^{-1} - \mu_0$                  | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ | $\mu_0$                                 | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            | $\lambda^{-1} - \mu_0$                  | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                       |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $\lambda^{-1} - \mu_0$                | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ |                                       | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ |                                       | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            |                                       | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                         |                                        |                                                           |                        |            |              |
|---------------------------------------------|-----------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{043324324333123321334234321331433}$ | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $1 - \mu_0$                             | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $\lambda^{-1} - \mu_0$                  | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $\lambda^{-1} - \mu_0$                  | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ | $1 - \mu_0$                             | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $\lambda^{-1} - \mu_0$                | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             | $\lambda^{-1} + \lambda^{-2} - \mu_0$ | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ |                                       | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  |                                       | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                  |                                         |                      |                                              |   |              |
|------------------|-----------------------------------------|----------------------|----------------------------------------------|---|--------------|
| $Q_{0\dots v} =$ | $Q_{043324324333123321334234321331433}$ | Verified predecessor | $t_v(Q_{0\dots v}) =$                        | T | $\Leftarrow$ |
| $a_{0\dots v} =$ | $1 - \mu_0$                             |                      | $t(a_{0\dots v} \in \{a_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $b_{0\dots v} =$ | $\lambda^{-1} - \mu_0$                  |                      | $t(b_{0\dots v} \in \{b_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $c_{0\dots v} =$ | $\lambda^{-1} - \mu_0$                  |                      | $t(c_{0\dots v} \in \{c_v^{\text{def}}\}) =$ | T | $\uparrow$   |
| $d_{0\dots v} =$ | $1 - \mu_0$                             |                      | $t(d_{0\dots v} \in \{d_v^{\text{def}}\}) =$ | T | $\uparrow$   |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = \lambda^{-1} - b_{0\dots v} =$  | $\mu_0$                               | $0 < a_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = -\lambda^{-1} + c_{0\dots v} =$ | $-\mu_0$                              | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v2} = 1 - d_{0\dots v} =$             |                                       | $0 < c_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - a_{0\dots v} =$             |                                       | $0 < d_2^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                          |                                        |                                                           |                        |            |              |
|---------------------------------------------|------------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{0433243243331233213342343213314333}$ | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = \sqrt{2} - d_{0\dots v} =$ | $\lambda^{-1} + \mu_0$                   | $\lambda^{-1} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = 1 - a_{0\dots v} =$        | $\mu_0$                                  | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = b_{0\dots v} =$            | $\lambda^{-1} - \mu_0$                   | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = 1 - c_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-2} + \mu_0$    | $\lambda^{-2} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                        |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|----------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$  |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - b_{0\dots v} =$            | $\lambda^{-1} + \lambda^{-2} + \mu_0$  | $\lambda^{-1} + \lambda^{-2} < a_4^{\text{def}} < 1$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = \lambda^{-1} + c_{0\dots v} =$ | $2\lambda^{-1} - \mu_0$                | $\lambda^{-1} < b_4^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = \lambda^{-1} - d_{0\dots v} =$ | $-\lambda^{-1} + \lambda^{-2} + \mu_0$ | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $d_{0\dots v4} = 1 - a_{0\dots v} =$            |                                        | $\lambda^{-1} < d_4^{\text{def}} < 1$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                                 |                                                |                                       |                                                           |                        |            |              |
|-------------------------------------------------|------------------------------------------------|---------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v1} = h_1(Q_{0\dots v})$             | $Q_{0433243243331233213342343213314331} = Q_0$ | verified                              | $\Leftarrow$                                              | $t_k(Q_{0\dots v1}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v1} = 1 - a_{0\dots v} =$            | $\mu_0$                                        | $0 < a_1^{\text{def}} < 1$            | $\Rightarrow t(a_{0\dots v1} \in \{a_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v1} = \lambda^{-1} - b_{0\dots v} =$ | $\mu_0$                                        | $0 < b_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(b_{0\dots v1} \in \{b_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v1} = \lambda^{-1} - c_{0\dots v} =$ | $\mu_0$                                        | $0 < c_1^{\text{def}} < \lambda^{-1}$ | $\Rightarrow t(c_{0\dots v1} \in \{c_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v1} = 1 - d_{0\dots v} =$            | $\mu_0$                                        | $0 < d_1^{\text{def}} < 1$            | $\Rightarrow t(d_{0\dots v1} \in \{d_1^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                 |                                        |                                                      |                                                           |                        |            |              |
|-------------------------------------------------|----------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v2} = h_2(Q_{0\dots v})$             | Forbidden successor of $Q_{0\dots v}$  |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v2}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v2} = 1 - d_{0\dots v} =$            | $\mu_0$                                | $\lambda^{-1} < a_2^{\text{def}} < 1$                | $\Rightarrow t(a_{0\dots v2} \in \{a_2^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v2} = \lambda^{-1} - a_{0\dots v} =$ | $-\lambda^{-1} + \lambda^{-2} + \mu_0$ | $0 < b_2^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v2} \in \{b_2^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $c_{0\dots v2} = \lambda^{-1} + b_{0\dots v} =$ |                                        | $\lambda^{-1} < c_2^{\text{def}} < 2\lambda^{-1}$    | $\Rightarrow t(c_{0\dots v2} \in \{c_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |
| $d_{0\dots v2} = 1 - c_{0\dots v} =$            |                                        | $\lambda^{-1} + \lambda^{-2} < d_2^{\text{def}} < 1$ | $\Rightarrow t(d_{0\dots v2} \in \{d_2^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

|                                             |                                          |                                        |                                                           |                        |            |              |
|---------------------------------------------|------------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v3} = h_3(Q_{0\dots v})$         | $Q_{0433243243331233213342343213314333}$ | verified                               | $\Leftarrow$                                              | $t_k(Q_{0\dots v3}) =$ | T          | $\Leftarrow$ |
| $a_{0\dots v3} = 1 - b_{0\dots v} =$        | $\lambda^{-1} + \lambda^{-2} + \mu_0$    | $\lambda^{-2} < a_3^{\text{def}} < 1$  | $\Rightarrow t(a_{0\dots v3} \in \{a_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v3} = c_{0\dots v} =$            | $\lambda^{-1} - \mu_0$                   | $0 < b_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(b_{0\dots v3} \in \{b_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v3} = 1 - d_{0\dots v} =$        | $\mu_0$                                  | $0 < c_3^{\text{def}} < 2\lambda^{-1}$ | $\Rightarrow t(c_{0\dots v3} \in \{c_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $d_{0\dots v3} = \sqrt{2} - a_{0\dots v} =$ | $\lambda^{-1} + \mu_0$                   | $\lambda^{-1} < d_3^{\text{def}} < 1$  | $\Rightarrow t(d_{0\dots v3} \in \{d_3^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |

|                                                  |                                       |                                                      |                                                           |                        |            |              |
|--------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------|------------|--------------|
| $Q_{0\dots v4} = h_4(Q_{0\dots v})$              | Forbidden successor of $Q_{0\dots v}$ |                                                      | $\Leftarrow$                                              | $t_k(Q_{0\dots v4}) =$ | F          | $\Leftarrow$ |
| $a_{0\dots v4} = 1 - d_{0\dots v} =$             | $\mu_0$                               | $0 < a_4^{\text{def}} < \lambda^{-1} + \lambda^{-2}$ | $\Rightarrow t(a_{0\dots v4} \in \{a_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $b_{0\dots v4} = 1 - a_{0\dots v} =$             | $\mu_0$                               | $0 < b_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(b_{0\dots v4} \in \{b_4^{\text{def}}\}) =$ | T                      | $\uparrow$ |              |
| $c_{0\dots v4} = -\lambda^{-1} + b_{0\dots v} =$ | $-\mu_0$                              | $0 < c_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(c_{0\dots v4} \in \{c_4^{\text{def}}\}) =$ | F                      | $\uparrow$ |              |
| $d_{0\dots v4} = \lambda^{-1} - c_{0\dots v} =$  |                                       | $0 < d_4^{\text{def}} < \lambda^{-1}$                | $\Rightarrow t(d_{0\dots v4} \in \{d_4^{\text{def}}\}) =$ |                        | $\uparrow$ |              |

