

Aula do dia 03/11/2020

①  $y = (I + GH)^{-1} GR$ ;  $y = TR \Rightarrow T = (I + GH)^{-1} G$

• Blocos:  $Z = Hy \rightarrow R - E = Hy \Rightarrow R - G^{-1}y = Hy \Rightarrow R = (H + G^{-1})y \Rightarrow$   
 $\Rightarrow R = (I + HG)G^{-1}y \Rightarrow (I + HG)^{-1}R = G^{-1}y \Rightarrow y = G(I + HG)^{-1}R \Rightarrow \boxed{T = G(I + HG)^{-1}}$

• prova-se:  $G(I + HG)^{-1} = (I + GH)^{-1}G = G(I + L)^{-1}$ , com  $L = HG$

②  $Z = Hy \Rightarrow Z = HGE = HG(R - Z) \Rightarrow HGR = (I + HG)Z \Rightarrow \boxed{(I + HG)^{-1}HG = ZR^{-1}}$

$y = GE \Rightarrow H^{-1}Z = G(R - Z) \Rightarrow GR = (H^{-1} + G)Z = (I + GH)H^{-1}Z \Rightarrow \boxed{ZR^{-1} = H(I + GH)^{-1}G}$

• juntando:  $\frac{Z}{R} = \frac{L}{I + L} = \frac{GH}{I + GH} = \frac{HG}{I + HG} \Rightarrow Z = Hy = HG(R - Z) \Rightarrow \boxed{\frac{Z}{R} = \frac{HG}{I + HG}}$

③  $\therefore y \left( \frac{R}{H} - y \right) \Rightarrow y = GR - yGH \Rightarrow \boxed{y = \frac{GR}{I + GH}}$

④  $\therefore y = (R - y) \cdot \frac{G}{I + G(H - I)} \Rightarrow y(I + G(H - I)) = GR - yG$   
 $\therefore y(I + GH - G + G) = GR \Rightarrow \boxed{y = \frac{GR}{I + GH}}$

⑤  $y = (R - y - y(H - I))G = (R - yH)G \Rightarrow \boxed{y = \frac{GR}{I + HG}}$

⑥  $y = (R - y(H - I) - y)G = (R - yH)G \Rightarrow \boxed{y = \frac{GR}{I + GH}}$

⑦  $y_1 = (R - y_1)G_1G_2 \Rightarrow \boxed{y_1 = \frac{RG_1G_2}{I + G_1G_2}}$

⑧  $y_2 = (D - G_1y_2)G_2 \Rightarrow \boxed{y_2 = \frac{DG_2}{I + G_1G_2}}$

⑨  $\therefore y = [(R - y)G_1 + D]G_2 \Rightarrow \boxed{y = \frac{(RG_1 + D)G_2}{I + G_1G_2}}$

⑩  $z = (W + y)y$   
 $z = W + (x + y)$   
 $\boxed{z = W + x + y}$

⑪  $\therefore y = \frac{(R - yH_3)G_1 \cdot \frac{G_2G_3G_4}{G_4} \cdot \frac{G_2G_3G_4}{I - G_2G_4H_1}}{I - H_3G_2G_4 + H_2G_2G_3 + H_3G_1G_2G_3G_4}$

⑫  $\therefore y = (R - H_3y)G_1 \cdot \frac{G_2G_3G_4}{I - G_2G_4H_1 + G_2G_3H_2}$

$$y = \frac{RG_1G_2G_3G_4}{I - H_1G_2G_4 + H_2G_2G_3 + H_3G_1G_2G_3G_4}$$