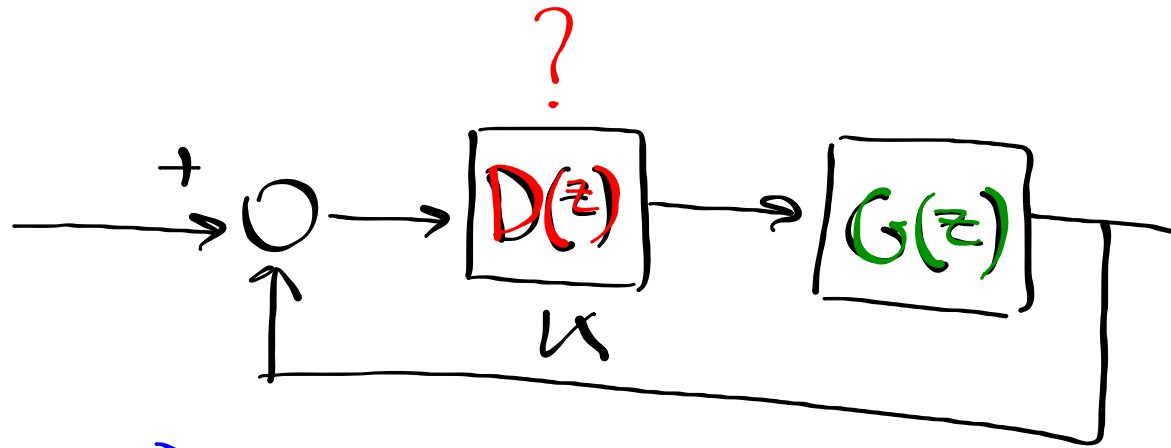


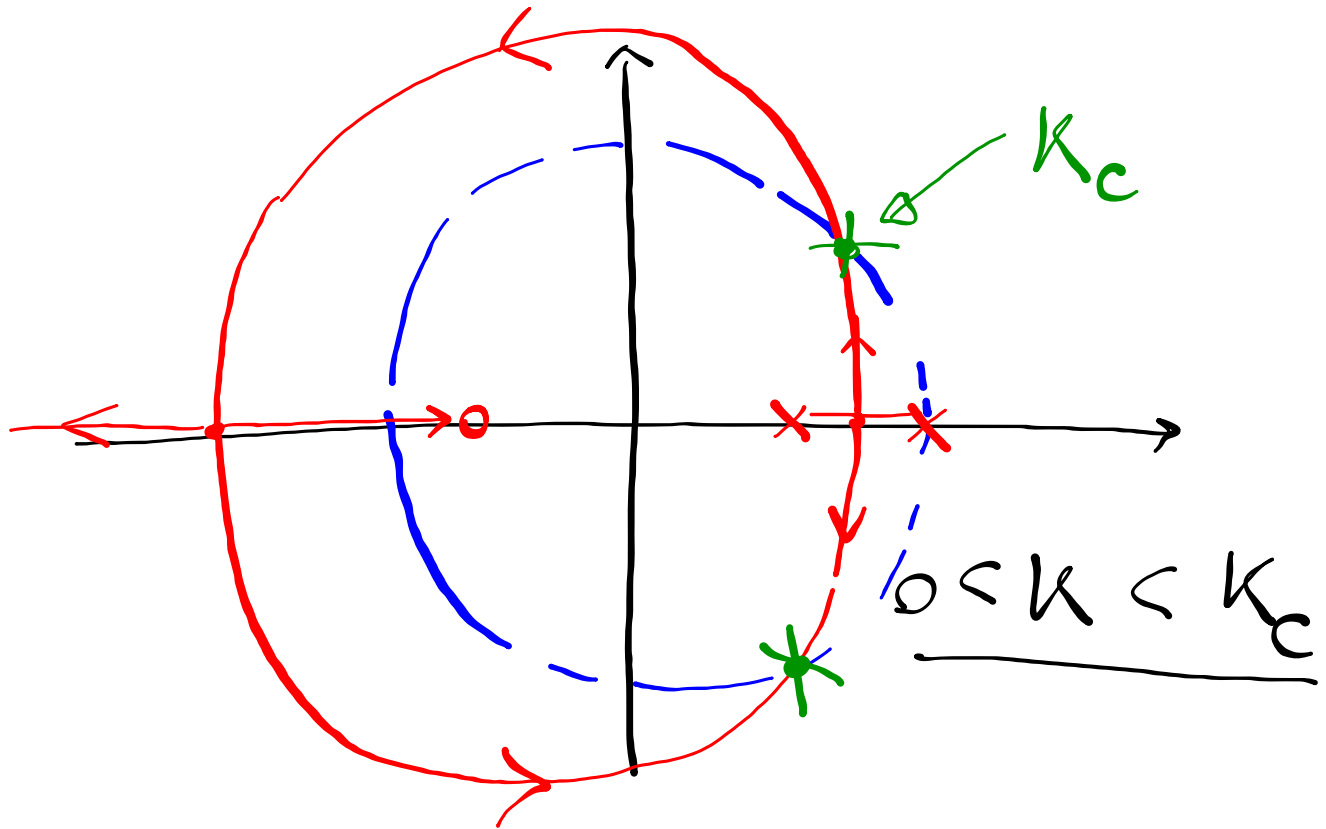
HE

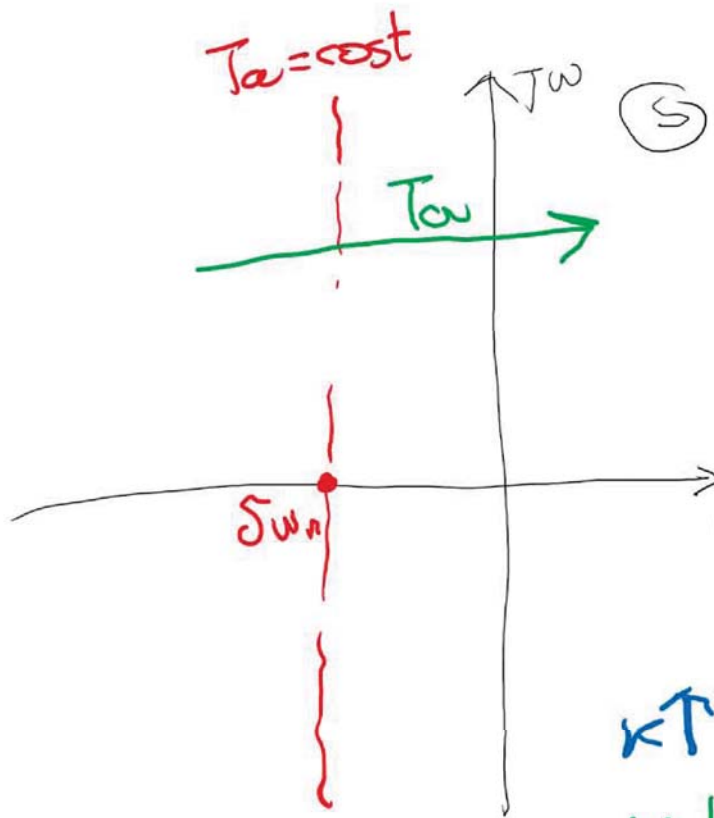
$$\rightarrow G(z) = \mathcal{Z} \left[ \frac{1 - e^{-sT}}{s} \cdot G(s) \right]$$

$$= (1 - z^{-1}) \mathcal{Z} \left[ \frac{G(s)}{s} \right]$$

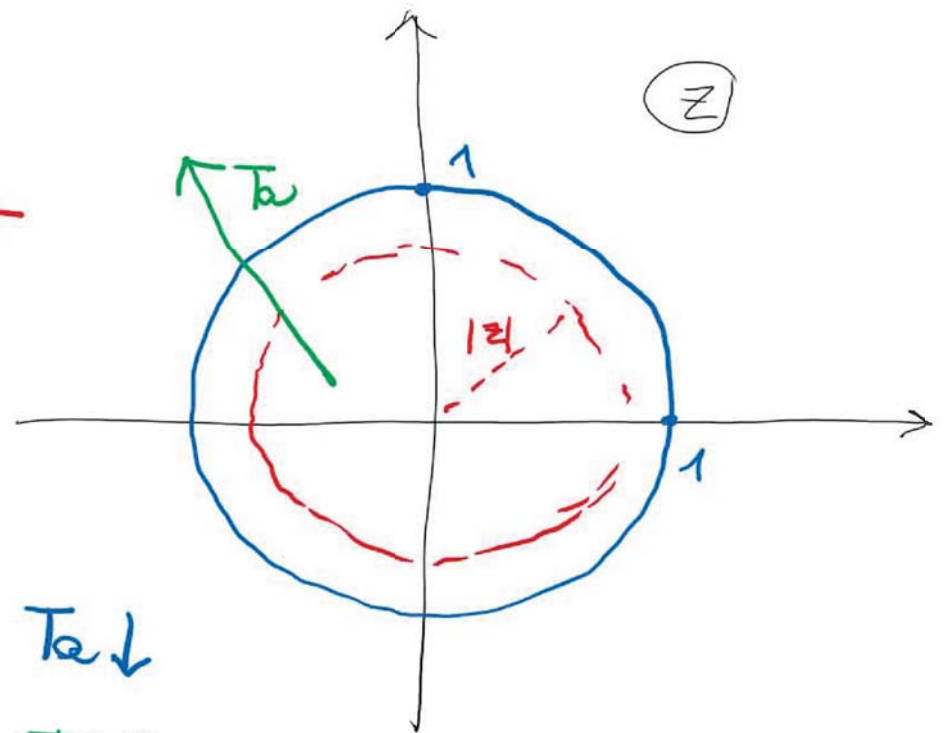


1)  ~~$D(z) = k$~~  ?  $\left\{ \begin{array}{l} S\% \leq 18\% (\delta \geq 0.5) \\ T_a \leq 7s \end{array} \right.$

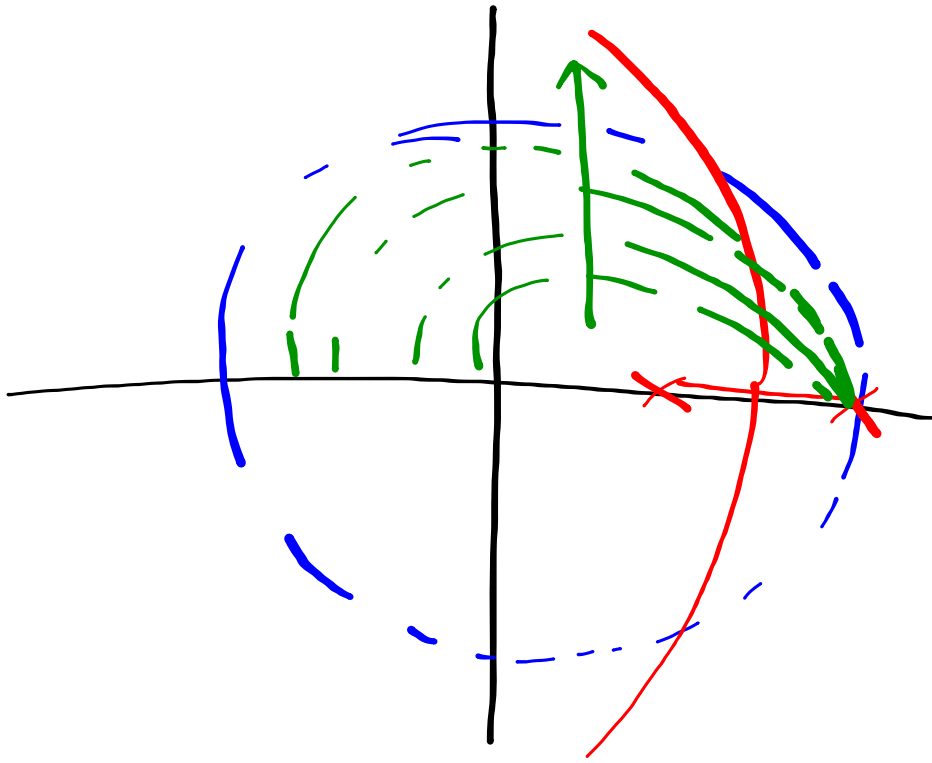




$z = e^{sT}$   
 $|z| = e^{\delta\omega_n T}$



$K \uparrow \Rightarrow S\% \uparrow \quad T_a \downarrow$   
 $K \downarrow \Rightarrow S\% \downarrow \quad T_a \uparrow$



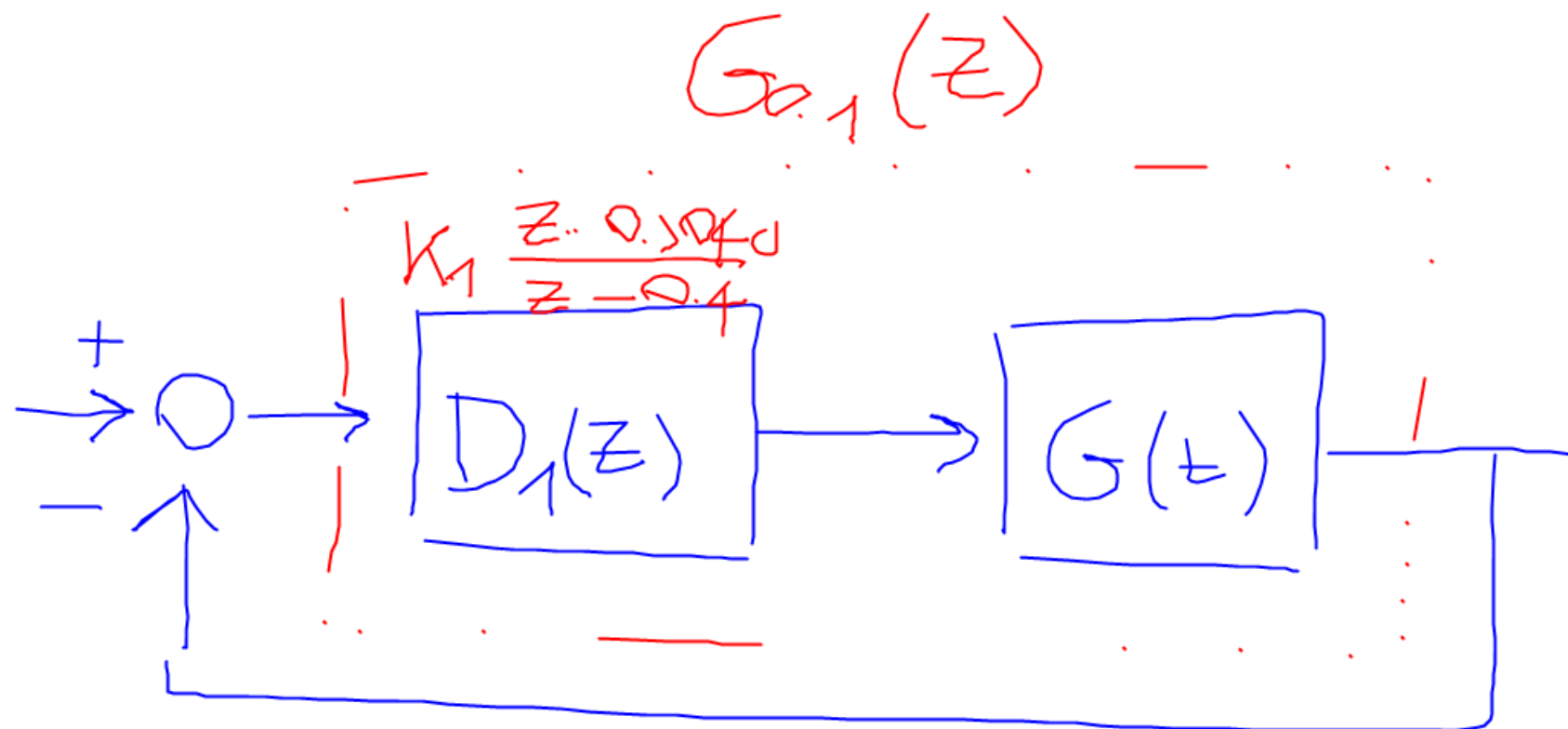
$$S \leq 18\% (\delta \geq 0.5)$$

$$G(z) = 0.0484 \frac{z + 0.968}{(z-1)(z-0.9048)}$$

$$\left\{ \begin{array}{l} 5\% \approx 18\% (\delta \geq 0.5) \\ T_a \approx 7s \end{array} \right.$$

$$D_1(z) = K_1 \frac{z - 0.9048}{z - 0.4}$$

$$G_{1a}(z) = K_1 \frac{z - 0.9048}{z - 0.4} \cdot G(z)$$

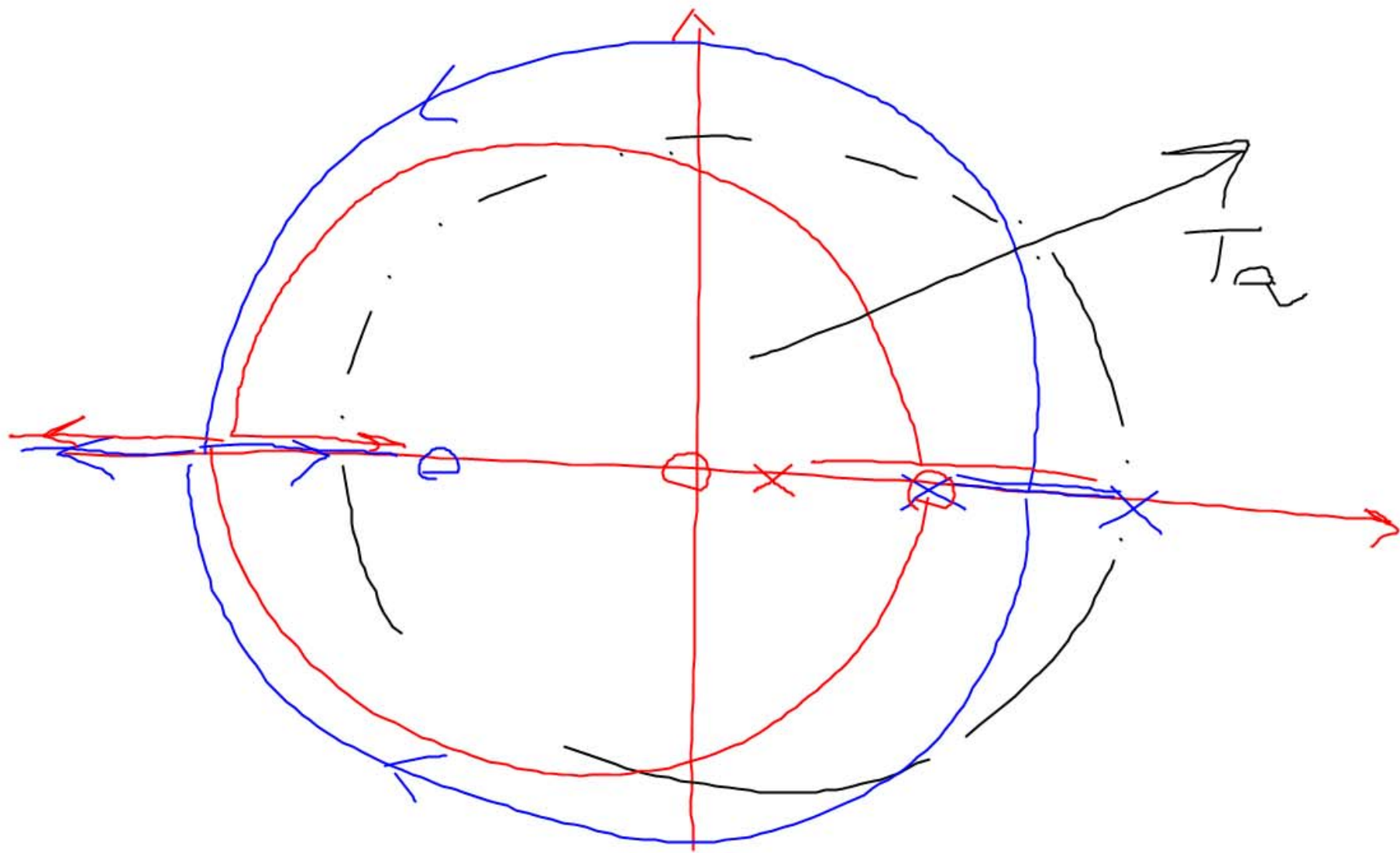


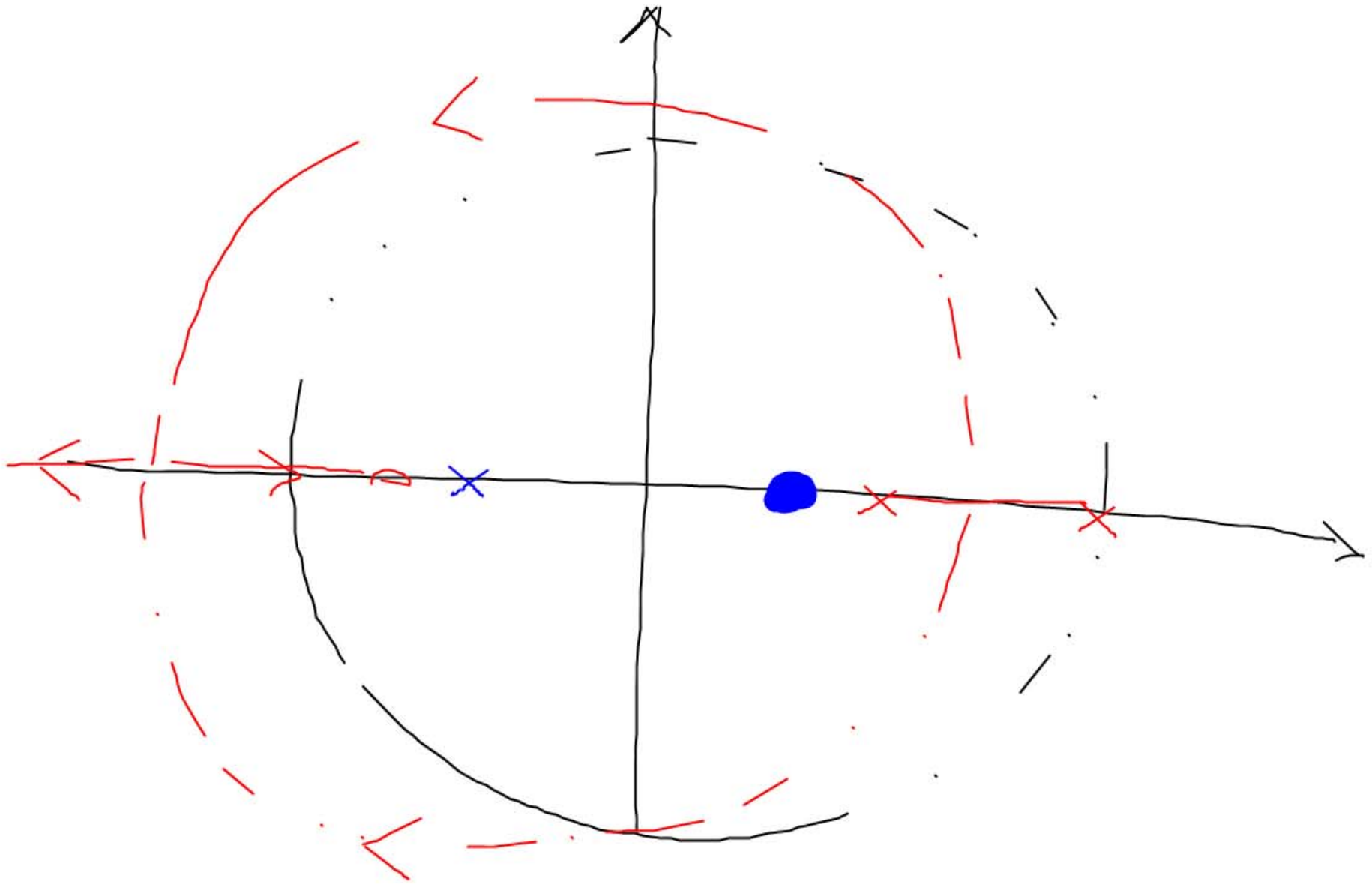


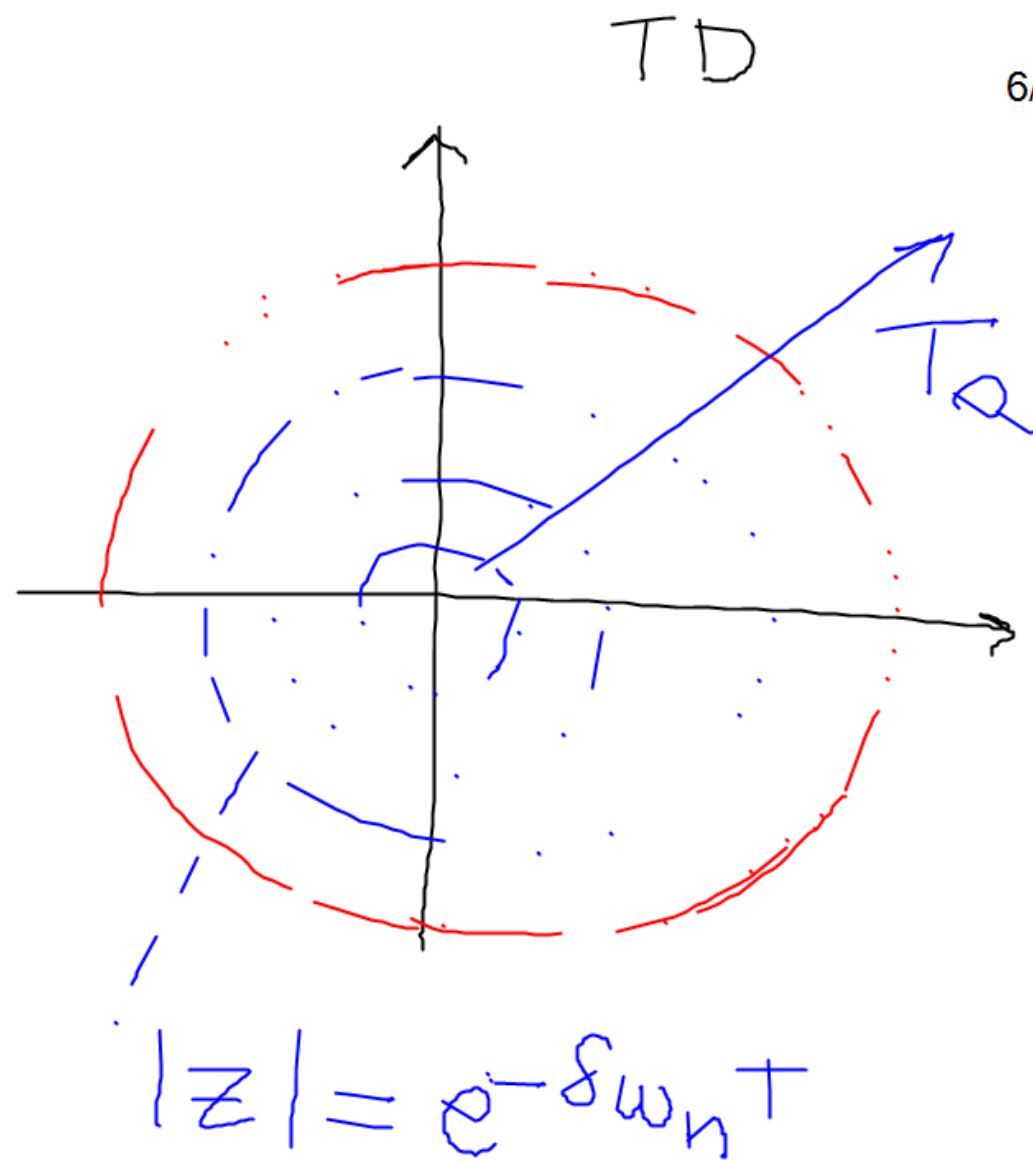
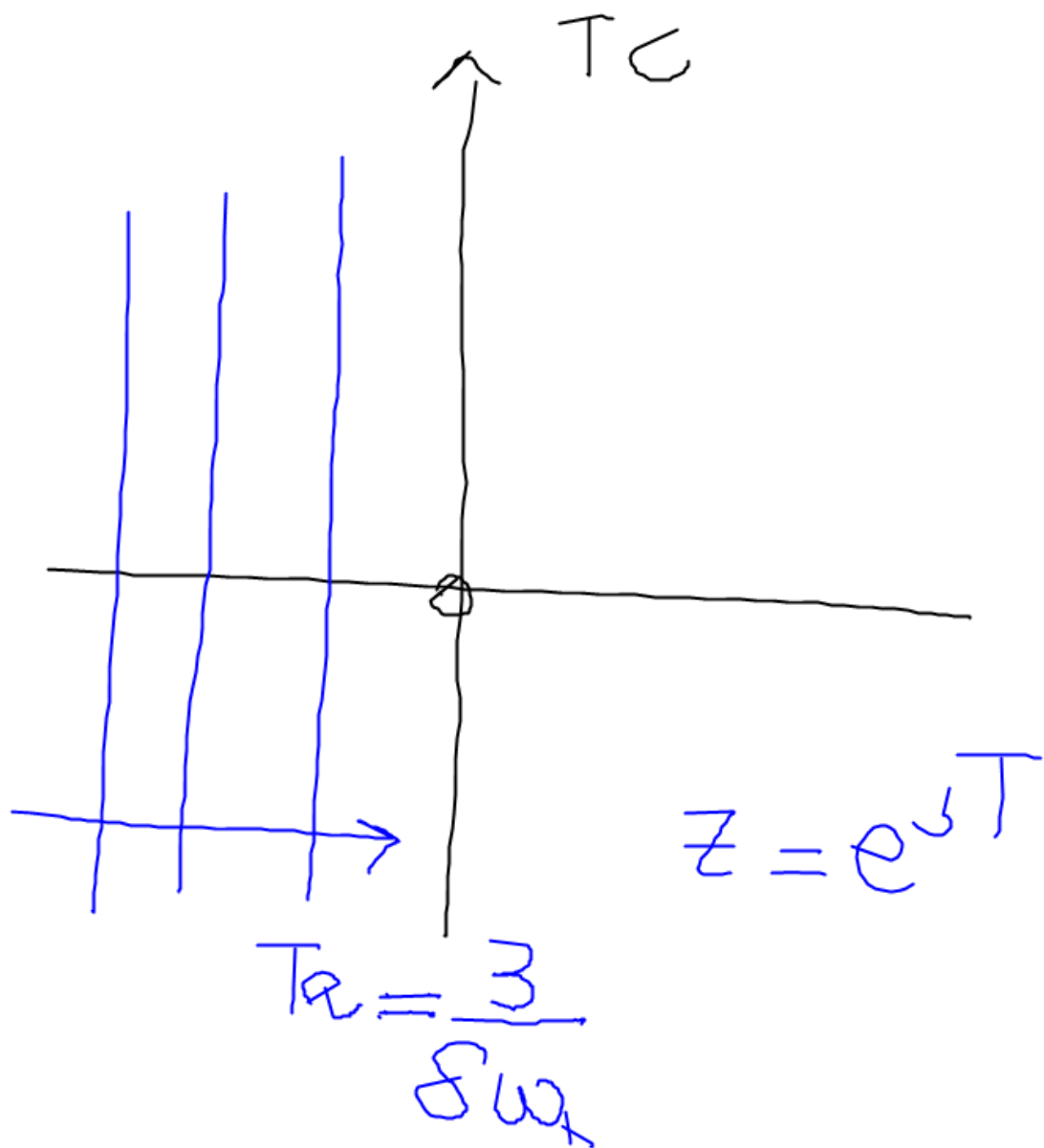
$$D_1(z) \cdot G(z)$$

$$K_1 \frac{\cancel{z - 0.9048}}{(z - 0.4)}$$

$$\left[ 0.0484 \frac{z + 0.9672}{(z - 1) \underbrace{(z - 0.9048)}} \right]$$







$$D_L(z) = 13 \frac{z - 0.88}{z + 0.5}$$