Calculate PID Controller Coefficients

Given PID Controller Parameters (see Matlab Simulation):

$$KP := 4.947 \qquad KI := 2.1987 \cdot 10^4 \qquad KD := 2.7827 \cdot 10^{-4}$$

Defining one parameter due to 1 degree of freedom:

$$R_1 := 10 \cdot 10^3$$

Calculate the missing parameters:

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Schätzwerte

$$C_I := 1 \cdot 10^{-9} \qquad C_D := 10 \cdot 10^{-9} \qquad R_2 := 100 \cdot 10^3$$

Nebenbedingungen

$$KP = \frac{R_2}{R_1} + \frac{C_D}{C_I} \qquad KI = \frac{1}{R_1 \cdot C_I} \qquad KD = R_2 \cdot C_D$$

Gleichungslöser

$$\begin{bmatrix} C_I \\ C_D \\ R_2 \end{bmatrix} := \mathbf{find}\left(C_I, C_D, R_2\right) = \begin{bmatrix} 4.548 \cdot 10^{-9} \\ 1.125 \cdot 10^{-8} \\ 2.473 \cdot 10^4 \end{bmatrix}$$

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