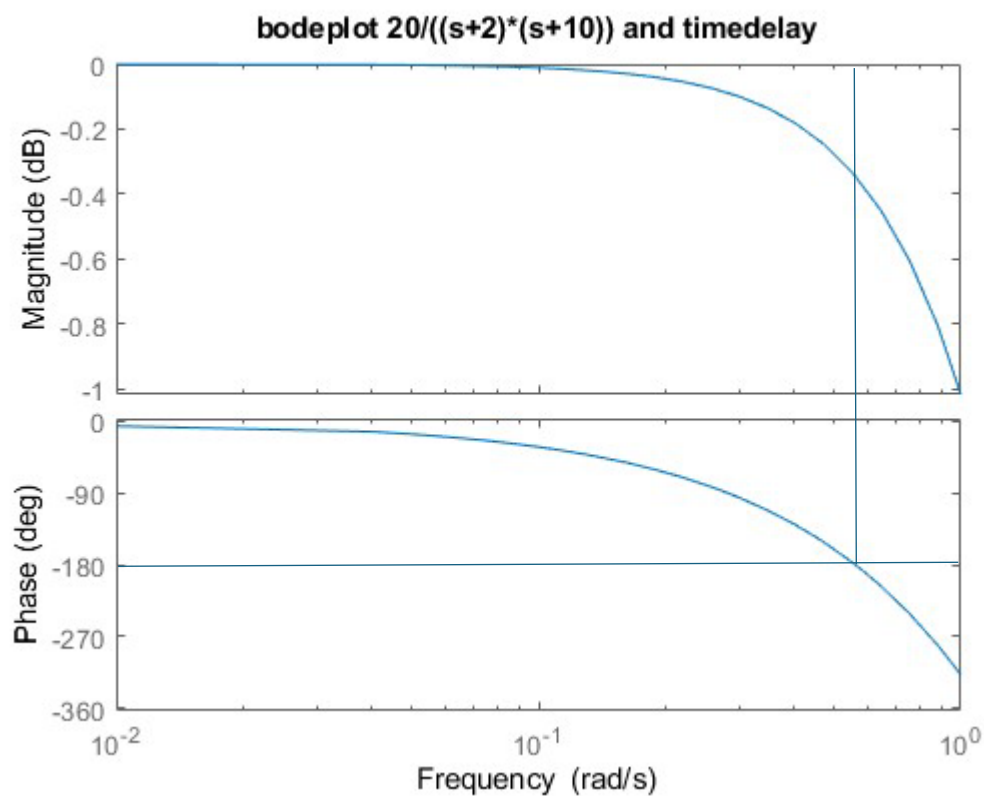Exercise time delay

A system can be described by a transport delay $T_d = 5$ and a second order transfer function $G(s) = \dfrac{20}{(s+2)(s+10)}$.

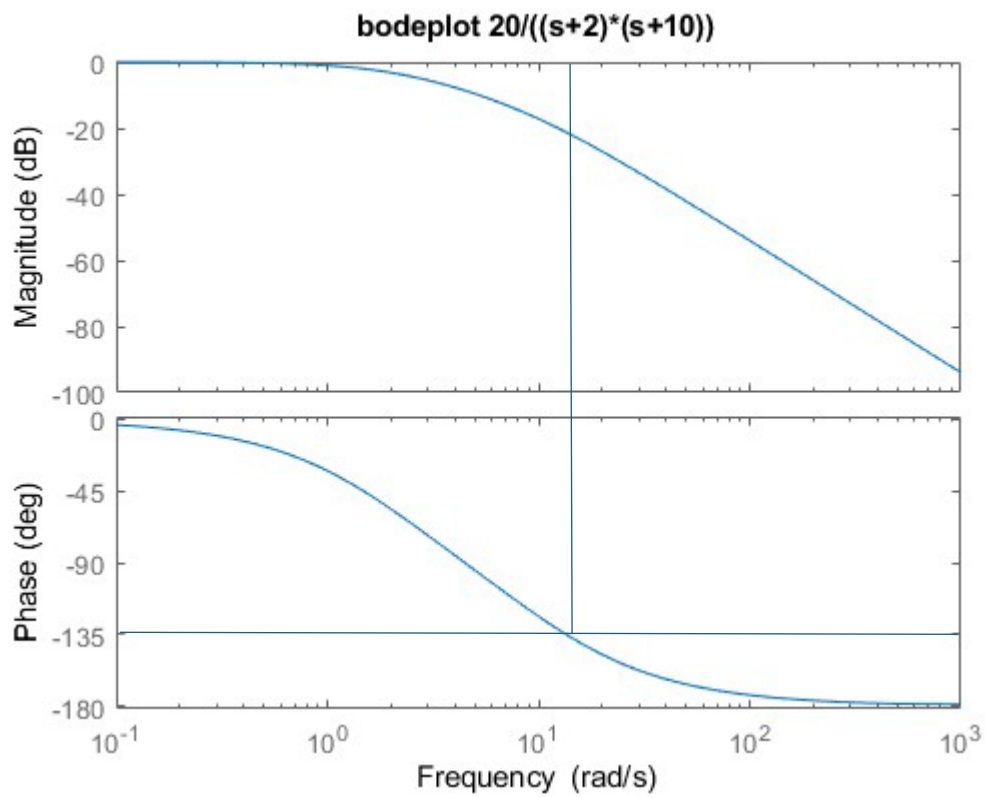Design a control system with a phase margin of 45

    a) without using Smith prediction
    b) with Smith prediction

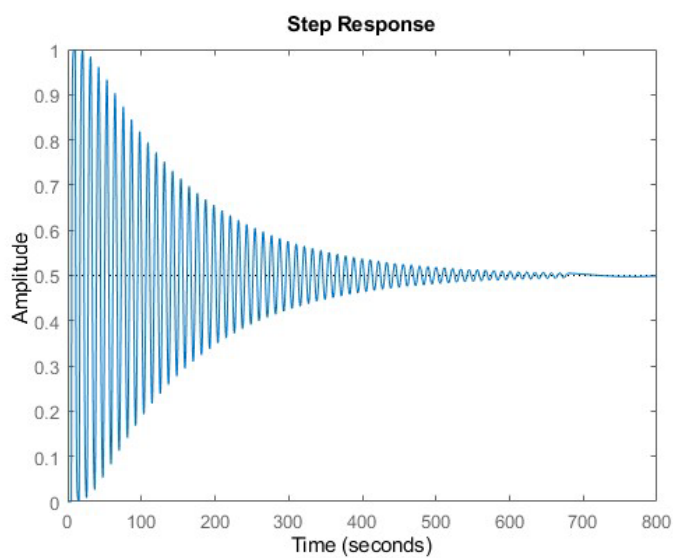Compare the step responses for a and b

We use P control

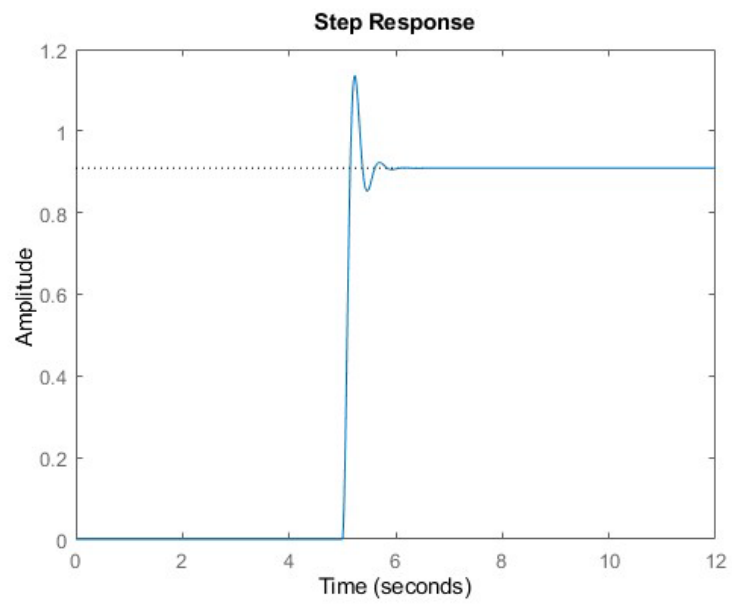bodeplot 20/((s+2)*(s+10)) and timedelay

K= 0.3 dB aprox 1

bodeplot 20/((s+2)*(s+10))

K= 20dB   approx. 10

a)

Step Response

Large stationary error - large oscillation due to difficulty in getting the right gain

B)

Step Response

better