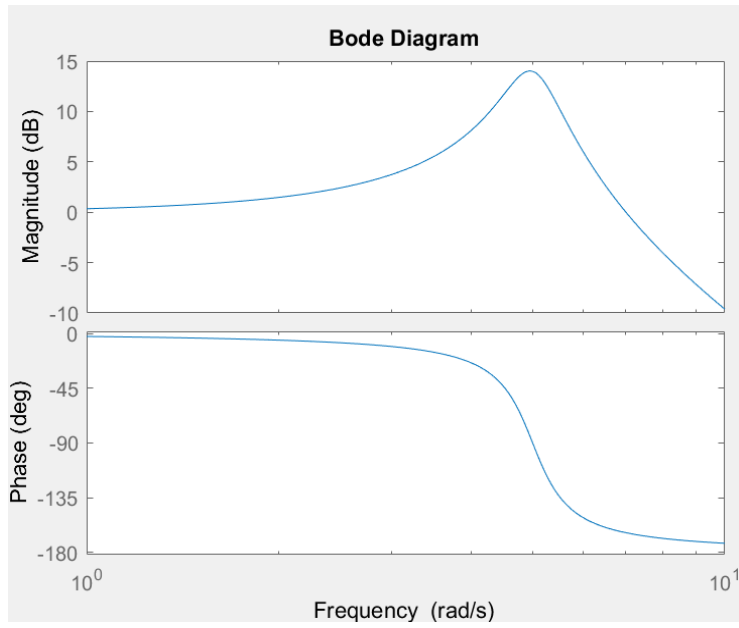


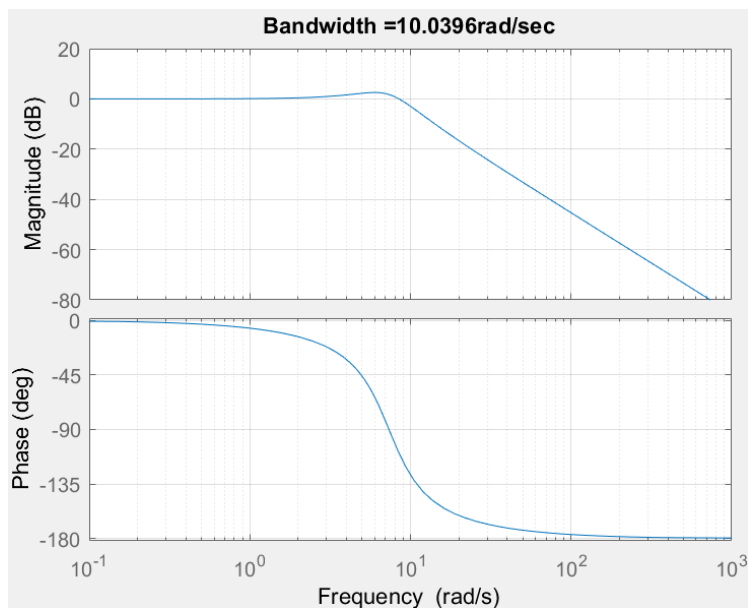
**CP8.1**



resonant frequency is 4.9458

peak magnitude is 14.0228

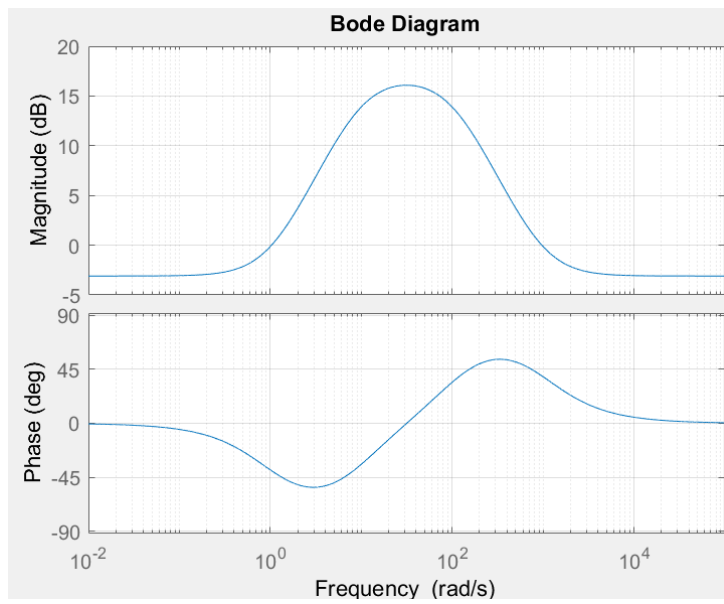
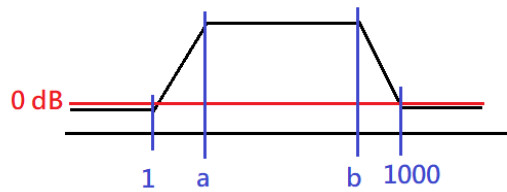
**CP8.4**



### CP8.9

To satisfy the requirement, we need to tune parameter K, a, b in function:

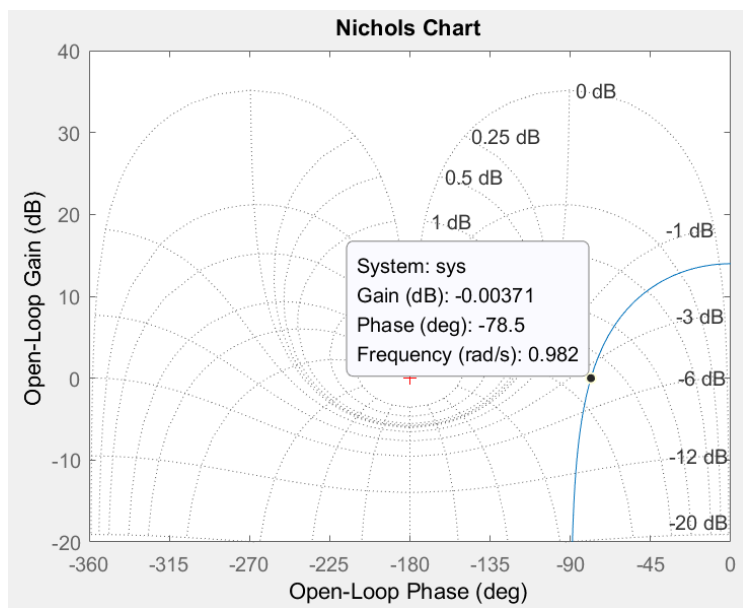
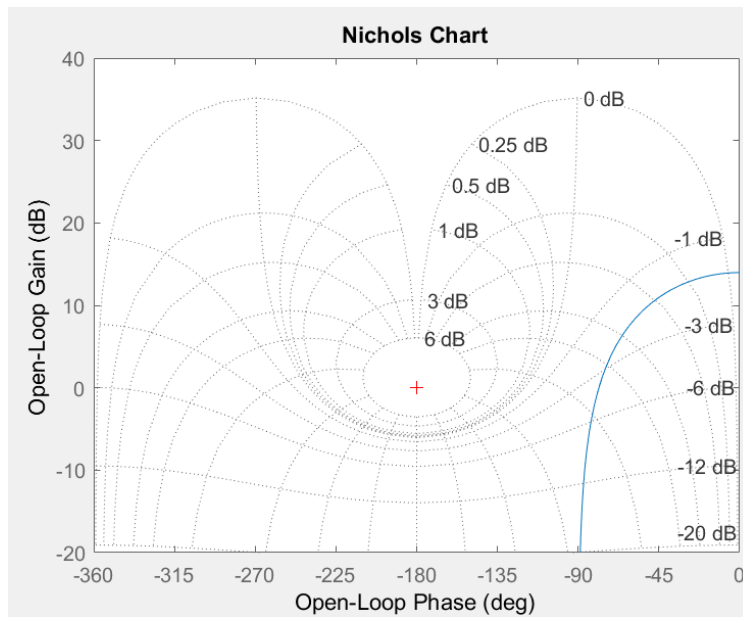
$$G(s) = K \frac{(s+1)(s+1000)}{(s+a)(s+b)}, \text{ where } 1 < a < b < 1000$$



resonant frequency is 31.6483

### CP9.3

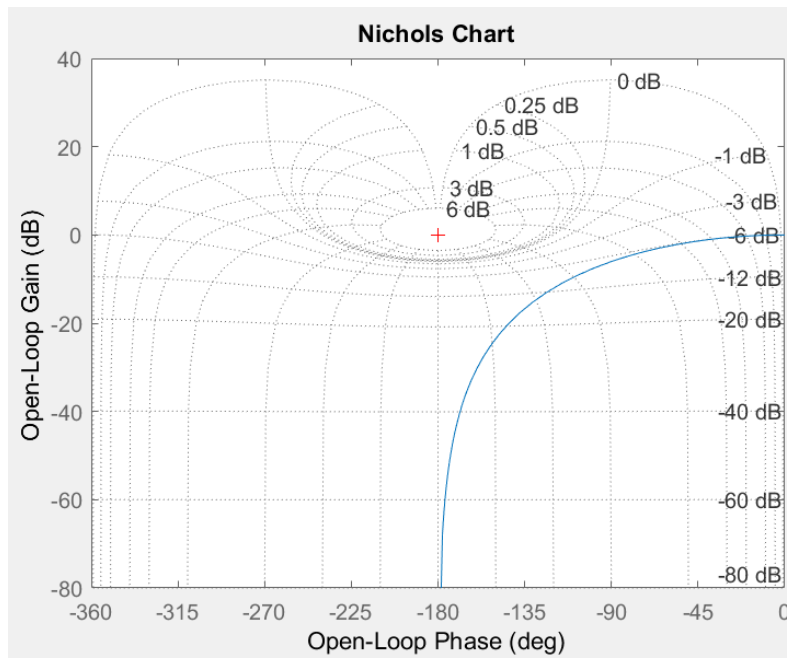
(a)



Gain margin: The plot reaches  $-180^\circ$  at infinite frequency ( $GM = \infty$ )

Phase margin:  $PM = 101.5^\circ$

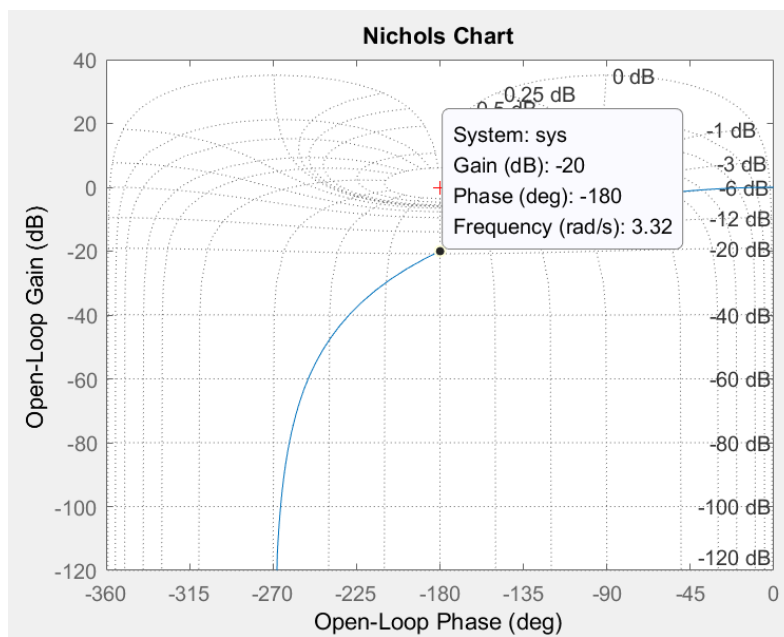
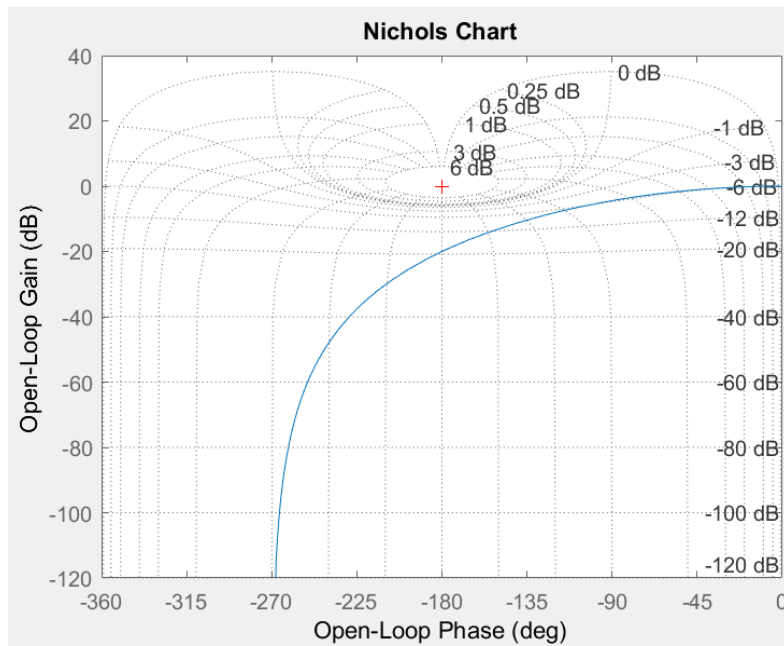
(b)



Gain margin: The plot reaches  $-180^\circ$  at infinite frequency ( $GM = \infty$ )

Phase margin: The plot reaches 0dB at infinite frequency ( $PM = \infty$ )

(c)



Gain margin:  $-20\text{dB}$

Phase margin: The plot reaches  $0\text{dB}$  at infinite frequency ( $\text{PM} = \infty$ )