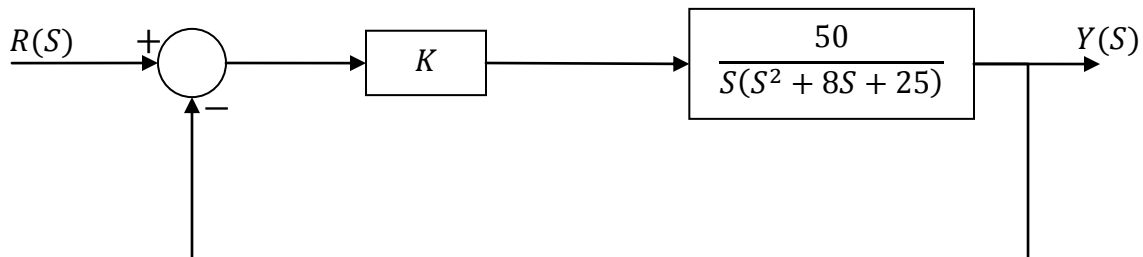


Quiz 1

Consider the system shown in the figure.



- Draw the bode plot of the **open loop** transfer function for $K = 1$. (1 point)
- Use the bode plot in part (a) to determine ω_{gc} , ω_{pc} , GM , and PM . (2 points)
- Find the value of K that results in a $GM = 20dB$. (1 point)
- Find the condition on K to have a $PM \geq 45^\circ$. (2 points)
- Find the value of K that makes the second order dominant poles of the closed loop system, have a settling time = 4 seconds. (2 points)
- For the value of K obtained in part (e), find the value of the steady state error for a unit ramp input, and the value of the maximum overshoot. (2 points)