

EE 380/Homework# 6

Q1

Plot the root locus of the following systems.

a

$$G(s)H(s) = \frac{K}{s(s+1)(s^2+4s+5)}$$

b

$$G(s)H(s) = \frac{K(s+4)}{(s+1)^2}$$

c

$$G(s)H(s) = \frac{K}{(s^2+2s+2)(s^2+2s+5)}$$

Also for (c) determine the exact points where the root loci cross the $j\omega$ axis.

Q2

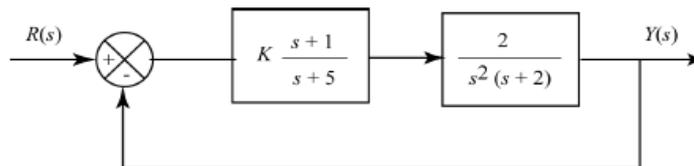


Figure Q2

Plot the root locus of the system shown in Figure Q2 and determine the range of gain K for stability.

Q3

Plot the Bode diagram for the following systems.

a

$$G(s)H(s) = \frac{s+1}{0.1s+1}$$

b

$$G(s)H(s) = \frac{1}{s(s^2+0.4s+4)}$$

c

$$G(s)H(s) = \frac{s+3}{(s+2)(s^2+2s+25)}$$