HW5

1. Chap 8 Prob. 1 (b)(d)(f)(h)

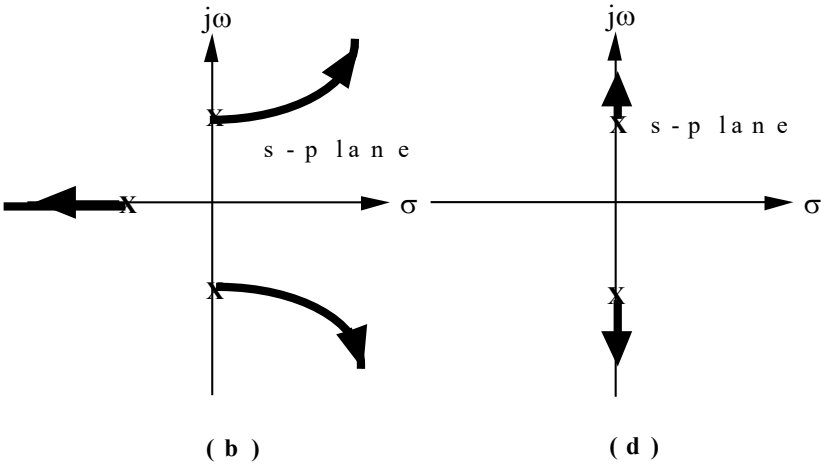
b. No: On real axis to left of an even number of poles and zeros

d. Yes

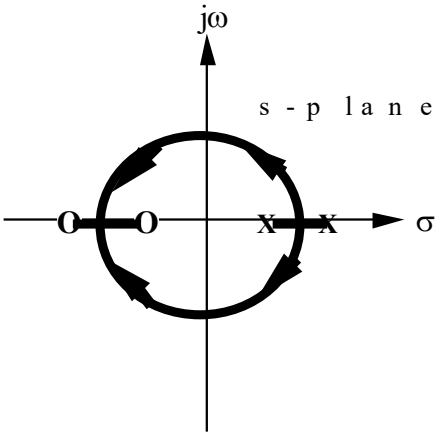
f. Yes

h. Yes

2. Chap 8 Prob. 2(b)(d)(f)



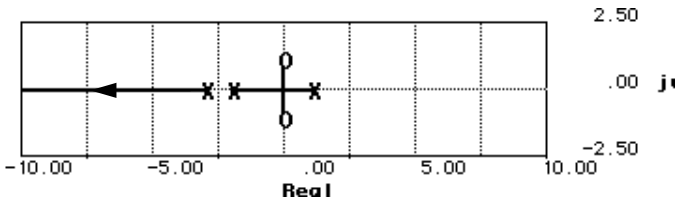
(b) **(d)**



(f)

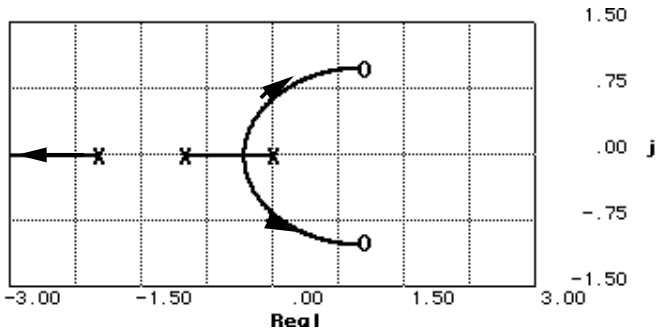
3. Chap 8 Prob. 10

a.



Root locus crosses the imaginary axis at the origin for K = 6. Thus the system is stable for K > 6.

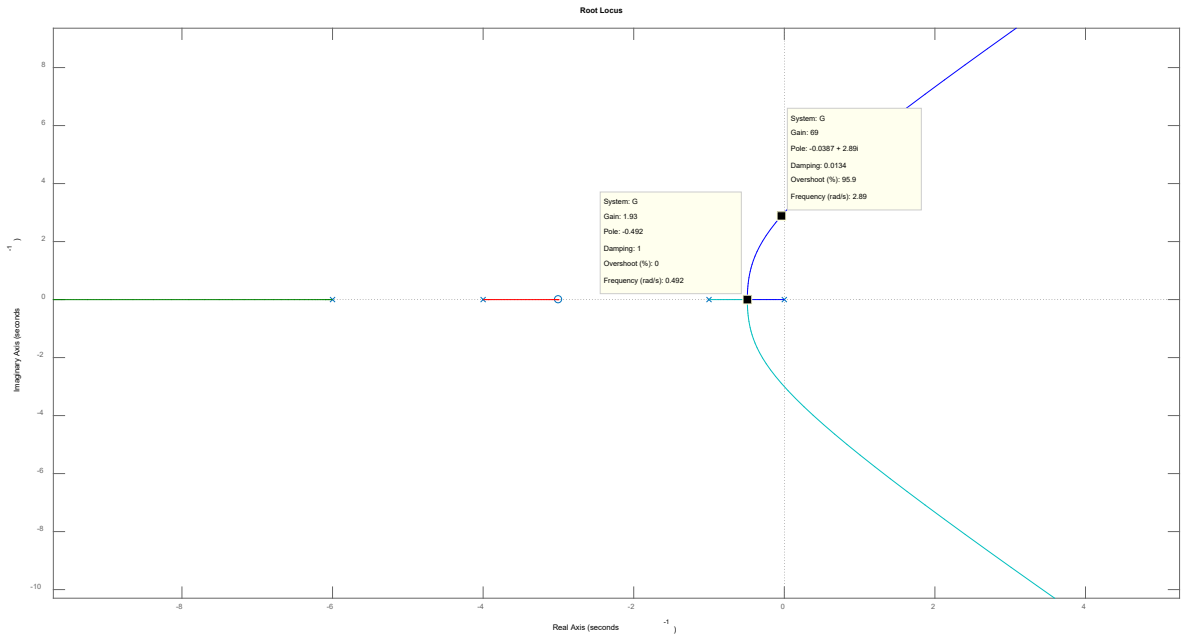
b.



$0 < K < 0.79$.

4. Chap 8 Prob. 14

a.



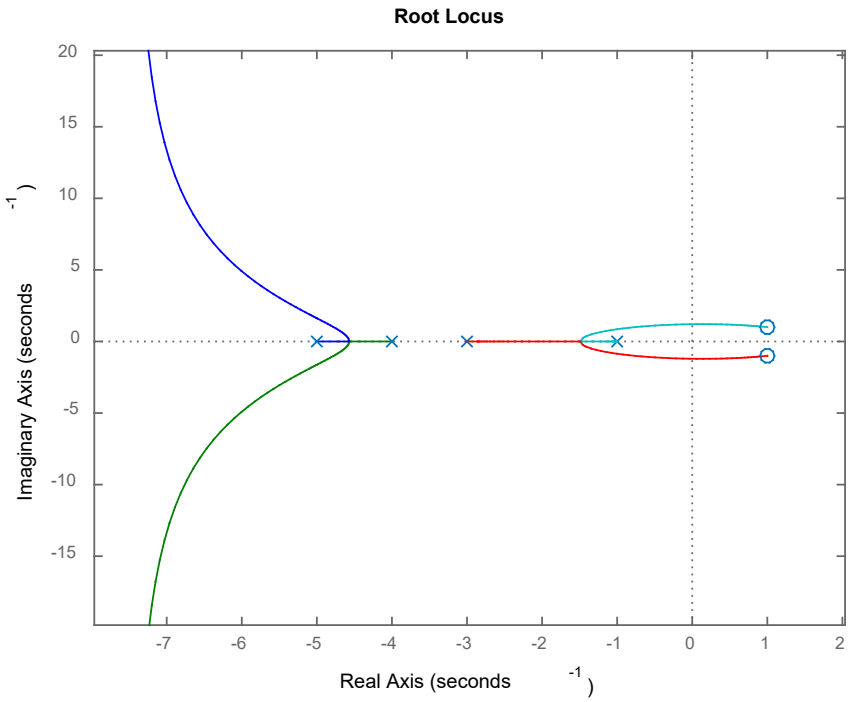
b. $\sigma_a = -\frac{8}{3};\ \theta = \frac{\pi}{3}, \pi, \frac{5\pi}{3}$

c. The system will have poles on the $j\omega$ axis when $K = 75$.

d. $K = 1.9256$.

5. Chap 8 Prob. 20(a)-(g)

(1)a



(2)b.

$\sigma_a = -7.5$

$\theta_a = \frac{\pi}{2}, \frac{3\pi}{2}$

(2)c. $-30 < K < 44.0252$.

(1)d. -4.5698 and -1.4908

(1)e. K = 12.8

(1)f. –0.558 ± j1.09, -5.94±j4.66

(2)g. Second-order approximation not valid because of the existence of closed-loop zeros in the rhp.