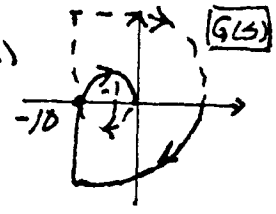
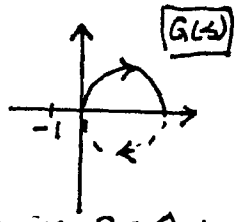
ECE 1673
HW#7 Solutions
1/1

8.10. (a)



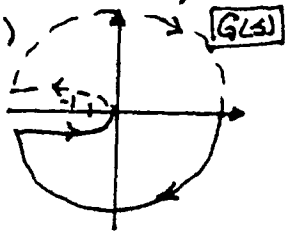
$Z = N + P = 2$; ∴ unstable

(b)



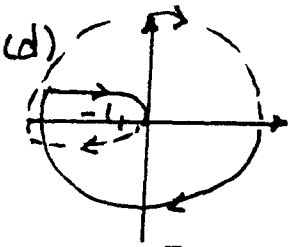
$Z = N + P = 0$; ∴ stable

(c)



$Z = N + P = 0$; ∴ stable

(d)



$Z = N + P = 2 + 0 = 2$, ∴ unstable

8.13. (a) $G(j5.7) \approx 0.12 \angle -180°$; ∴ gain margin $\approx \frac{1}{0.12} = \underline{8.33}$

$G(j1.5) \approx 1 \angle -100°$; $\phi_m \approx \underline{80°}$

(b) $2.5\,G(j5.7) \approx 0.30 \angle -180°$; ∴ gain margin $\approx \frac{1}{0.3} = \underline{3.33}$

$2.5\,G(j3) \approx 1 \angle -144°$; ∴ $\phi_m \approx \underline{36°}$

(c) $T(j1) = \dfrac{1.573 \angle -77.3°}{1 + 1.573 \angle -77.3°} = \dfrac{1.573 \angle -77.3°}{2.042 \angle -48.8°} = \underline{3.85 \cos(t + 15°)}$