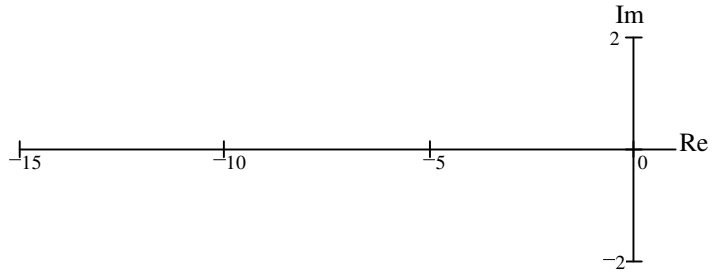


ECE 3510 Basic Root Locus Examples

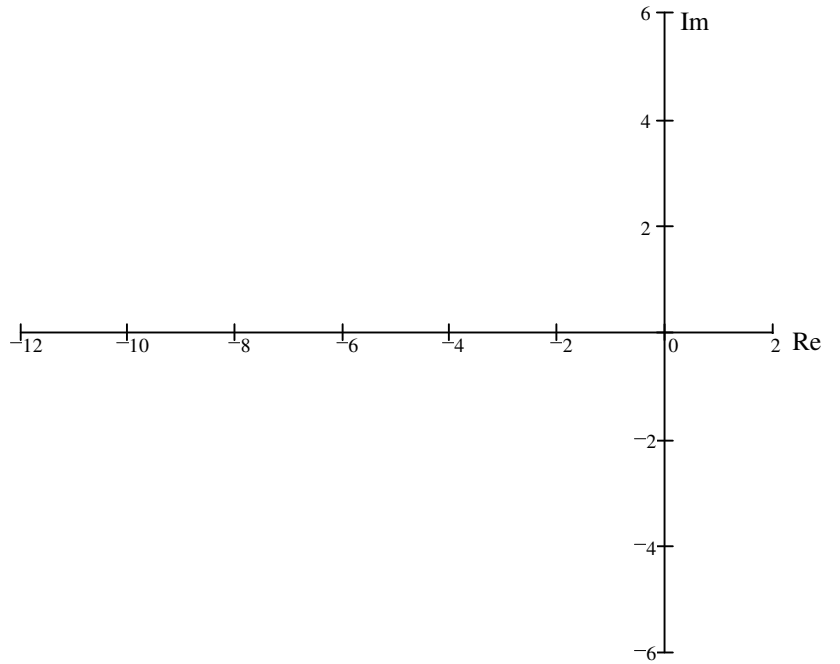
a

Sketch (by hand) the root-locus plots for the following open-loop transfer functions:
For these hand sketches, just use the rules on the first page of the notes
Mention the rules used and show work.

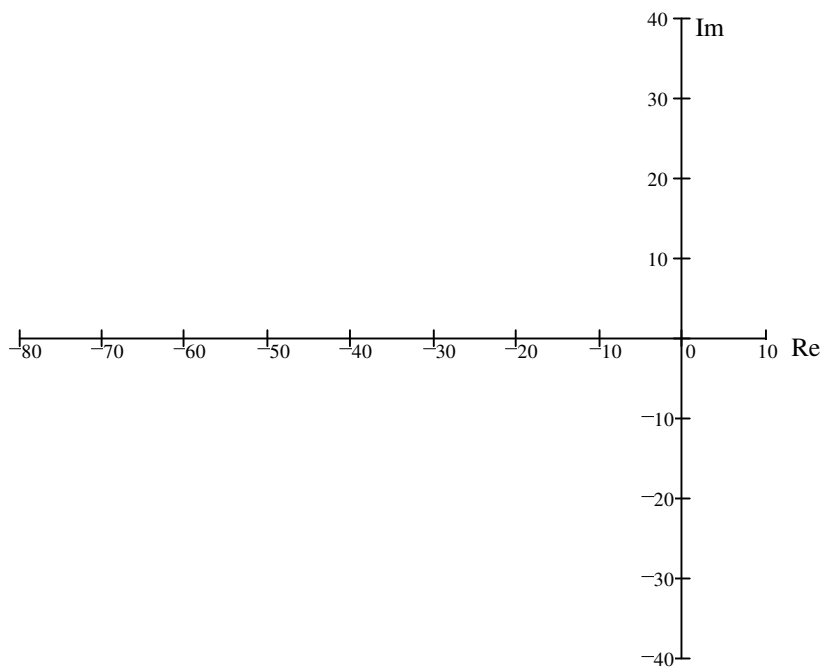
1. $G(s) = \frac{s + 6}{(s + 1) \cdot (s + 10)}$



2. $G(s) = \frac{20}{(s + 2) \cdot (s + 10)}$

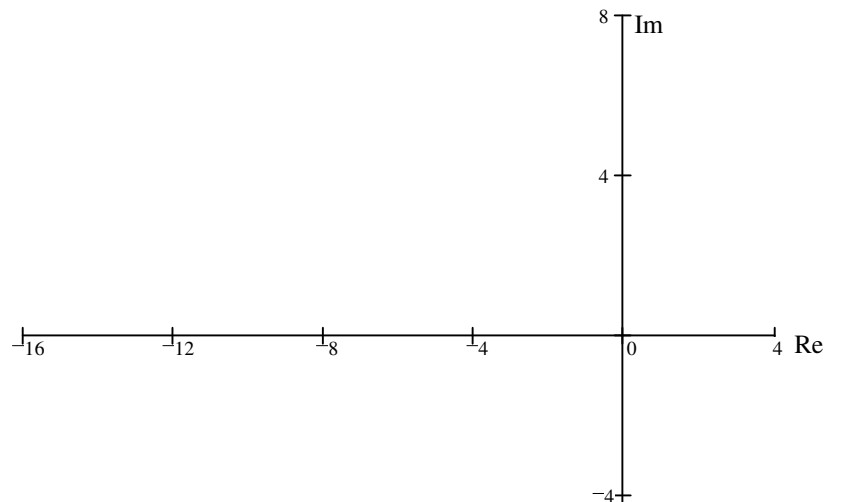


3. $G(s) = \frac{1}{s \cdot (s + 16.64) \cdot (s + 53.78)}$

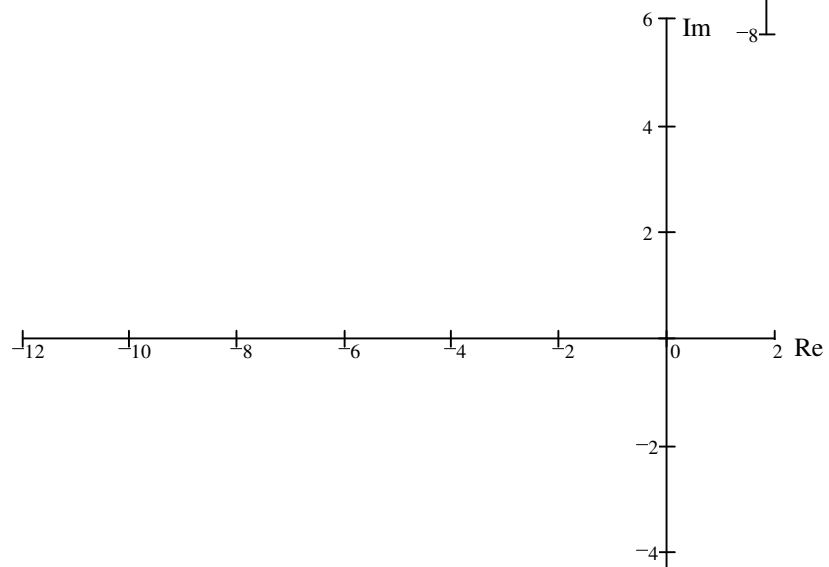


Basic Root Locus Examples p2

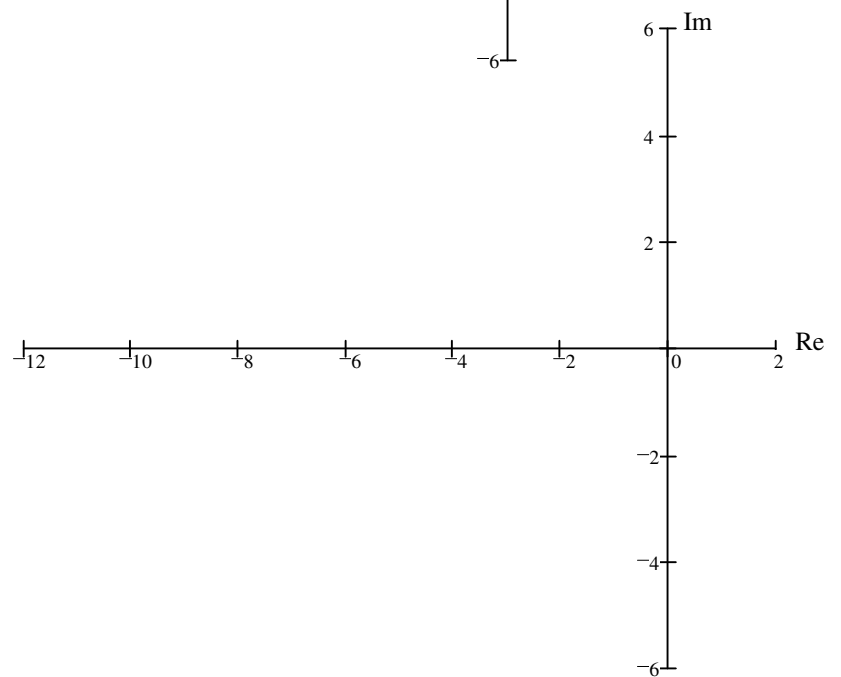
$$4. G(s) = \frac{4 \cdot s + 40}{s \cdot (s + 2) \cdot (s + 8) \cdot (s + 4)}$$



$$5. G(s) = \frac{3 \cdot s + 18}{s \cdot (s + 4) \cdot (s + 10)}$$




$$6. G(s) = \frac{s + 8}{(s + 1) \cdot (s + 3)^3}$$



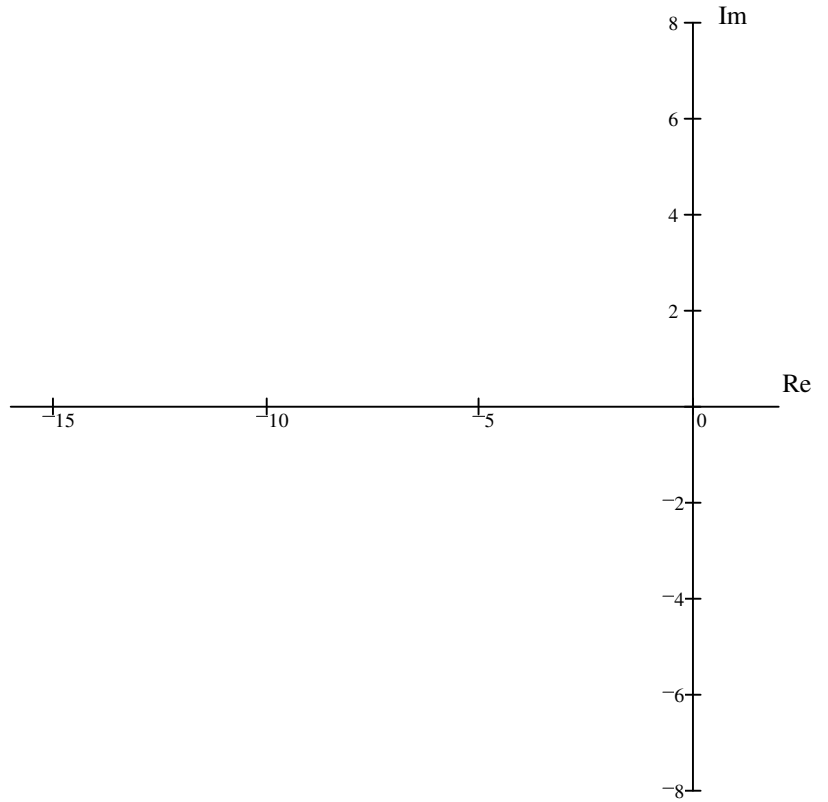
Basic Root Locus Examples p4

10 $G(s) = \frac{s+3}{(s+6)^3 \cdot (s+12)}$ $m := 1$
 $n := 4$
 $n - m = 3$

asymptotes: 

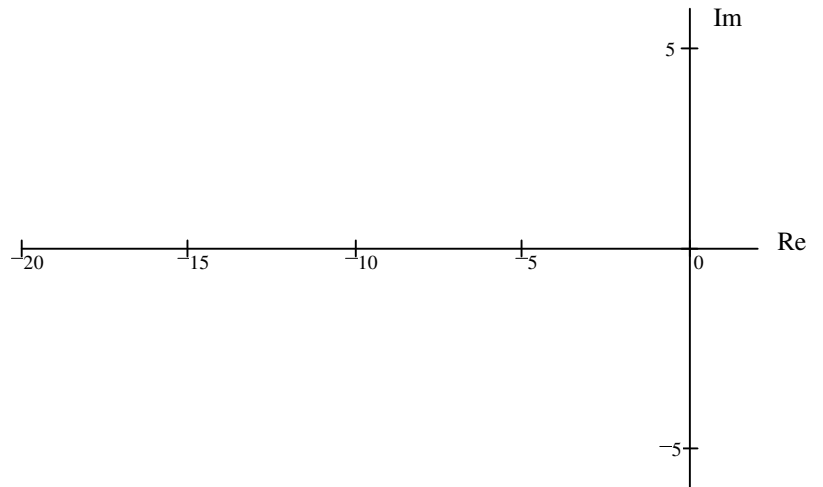
centroid:

$$\sigma_C = \frac{(3 \cdot (-6) + (-12)) - (-3)}{3} = -9$$



11 $G(s) = \frac{(s+3) \cdot (s+12)}{(s+6)^3}$ $m := 2$
 $n := 3$
 $n - m = 1$

no asymptotes



12 $G(s) = \frac{(s+3) \cdot (s+12)^2}{(s+6)^3}$ $m := 3$
 $n := 3$
 $n - m = 0$

no asymptotes

