ECE 3510 homework RL2

b

1. Sketch (by hand) the root-locus plots for the following open-loop transfer functions:
   Mention the rules used and show work.

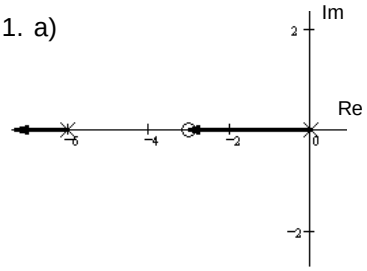
a) $\dfrac{s+3}{s\cdot(s+6)}$ b) $\dfrac{4}{s\cdot(s+3)}$ c) $\dfrac{1}{s\cdot(s+2)\cdot(s+4)}$

d) $\dfrac{s+7}{s\cdot(s+2)\cdot(s+4)}$ e) $\dfrac{2s+6}{s\cdot(s+2)\cdot(s+4)}$ f) $\dfrac{8}{(s+2)^3}$

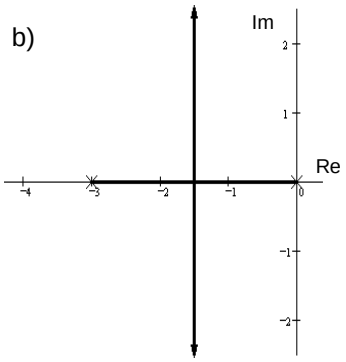
2. Nise, Ch.8, problem 1 (Nise problems may be on the back of this page) 3. Nise, Ch.8, problem 2

Answers

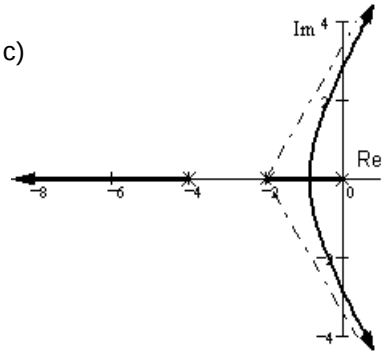
1. a)



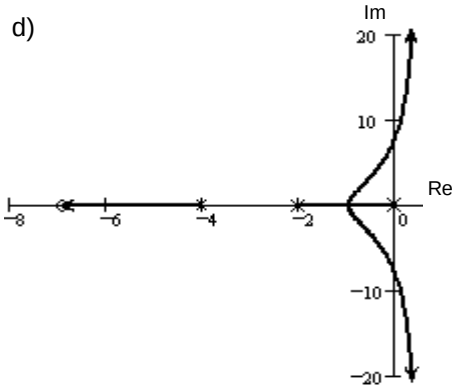
b)



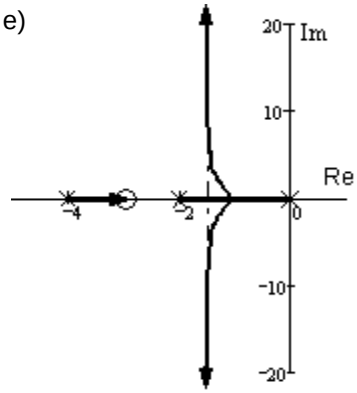
c)



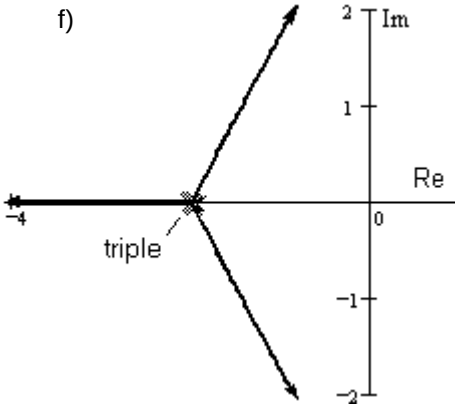
d)



e)



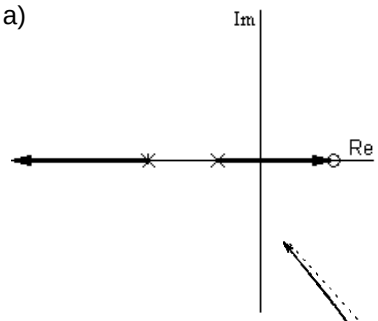
f)



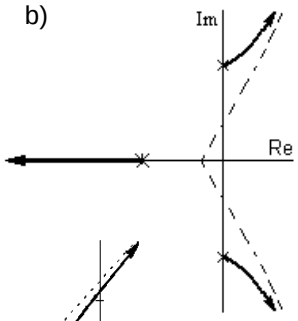
2. a) No: Not symmetric; On real axis to left of an even number of poles and zeros
   3rd ed. b) No: Given these OL poles & zeros, centroid won't be left of left-most pole, so RL won't bend leftward
   3rd ed. c) Yes d) Yes e) No: Not symmetric; Not on real axis to left of odd number of poles and/or zeros
   f) Yes g) No: Not symmetric; real axis segment is not to the left of an odd number of poles h) Yes

Note: **4th, 5th, 6th ed.** answer differences:
   b) & c) No: On real axis to left of an even number of poles and zeros. Both violate real-axis rule.

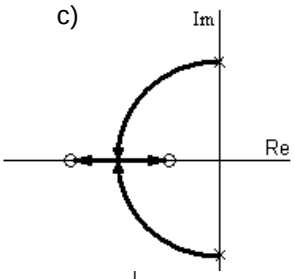
3. a)



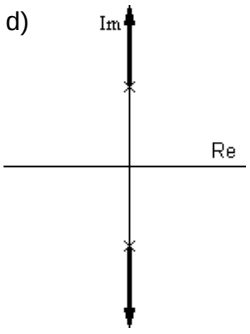
b)



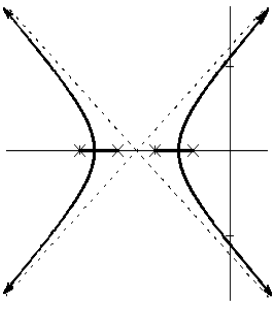
c)



d)



e)



f)