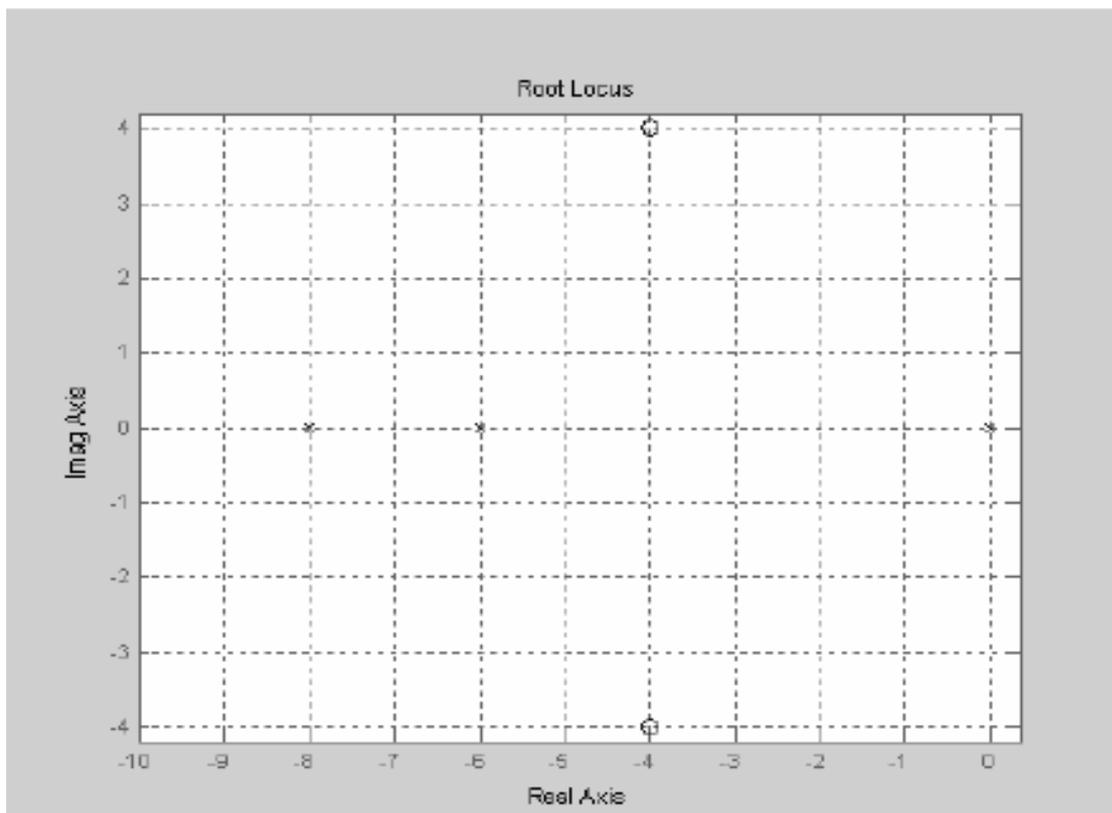


Problem # 1

Using the pole-zero plot shown below, do the following for the positive root-locus:

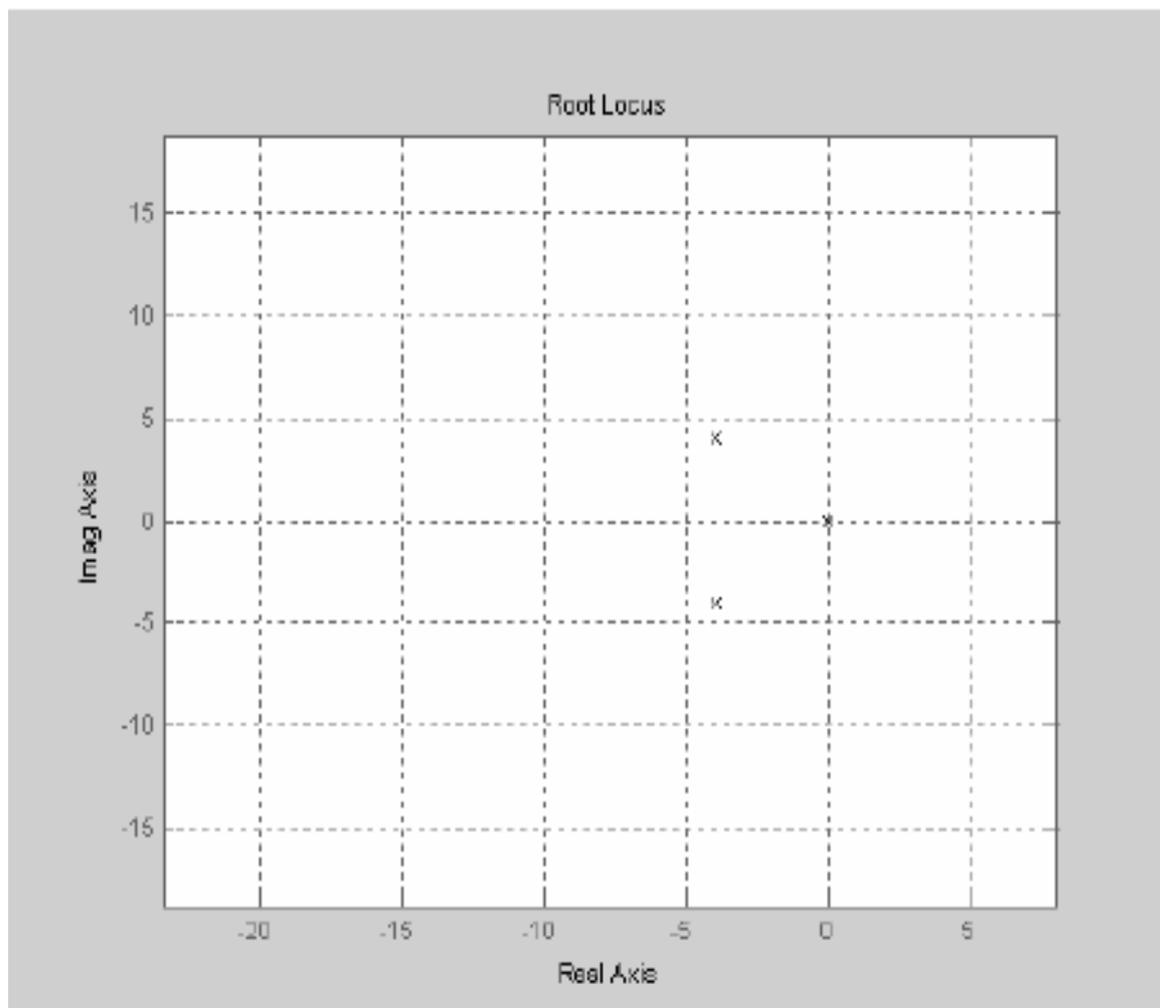
- (a) Find the expression for $L(s)$.
- (b) How many branches does the root-locus have?
- (c) What is the value of K at the poles?
- (d) What is the value of K at the zeros?
- (e) Sketch and label the real-axis parts of the locus.
- (f) Compute, mark and label the asymptote center.
- (g) Compute, sketch and label the asymptotes.
- (h) Compute the departure angles from the poles.
- (i) Compute the arrival angles at the zeros.
- (j) How does the arrival angle help you sketch the root-locus?
- (k) If the locus crosses the imaginary axis, find ω and K at the crossing point.
- (l) Compute K for real values of s in the range where you suspect a break point.
- (m) Sketch the general shape of the locus.



Problem #2

Using the pole-zero plot shown below, do the following for the positive root-locus:

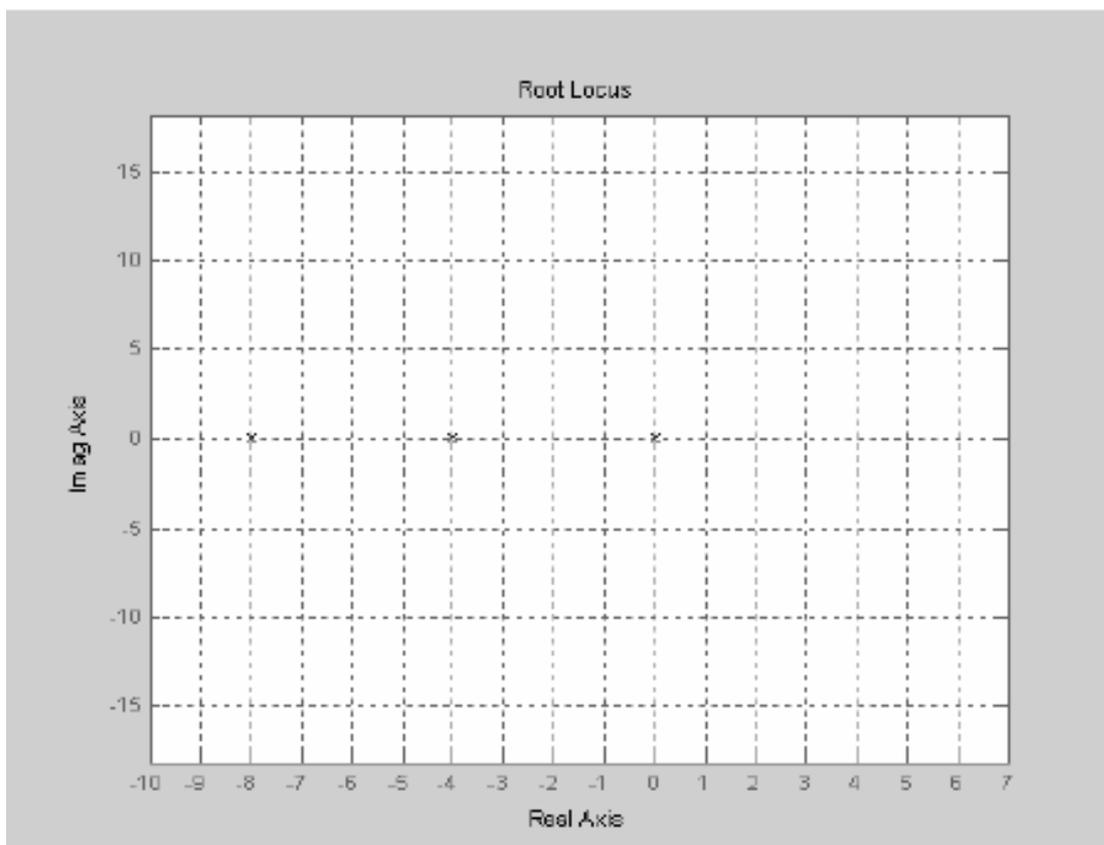
- (a) Find the expression for $L(s)$.
- (b) Sketch and label the real-axis parts of the locus.
- (c) Compute, mark and label the asymptote center.
- (d) Compute, sketch and label the asymptotes.
- (e) If the locus crosses the imaginary axis, find ω and K at the crossing point.
- (f) Sketch the general shape of the locus.



Problem #3

Using the pole-zero plot shown below, do the following for the positive root-locus:

- Find the expression for $L(s)$.
- Sketch and label the real-axis parts of the locus.
- Compute, mark and label the asymptote center.
- Compute, sketch and label the asymptotes.
- If the locus crosses the imaginary axis, find ω and K at the crossing point.
- Plot K for real-values of s . Where is the breakaway point?
- Sketch the general shape of the locus.



Problems 4-9 from your text:

E7.1, E7.2, E 7.8, E 7.24, P 7.1, MP 7.4

Note: $L(s) = G(s) H(s)$