ECE 486: Control Systems

Lecture 12A: Root Locus Rules DEF
Consider the following functions.

\[ L = \frac{1}{s^2 + 2s + 10}, \quad L = \frac{s - 3}{s^2 + 2s + 10}, \quad L = \frac{s + 4}{s^5 + 1} \]

Sketch the root loci by hand by applying rules A-F.
Consider the following functions.

\[ L = \frac{1}{s^2 + 2s + 10} \]

Sketch the root loci by hand by applying rules A-F.
Consider the following functions.

\[ L = \frac{s - 3}{s^2 + 2s + 10} \]

Sketch the root loci by hand by applying rules A-F.
Consider the following functions.

\[ L = \frac{s + 4}{s^5 + 1} \]

Sketch the root loci by hand by applying rules A-F.
Solution 1-Extra Space
ECE 486: Control Systems

Lecture 12B: Case Study on Root Locus Design
Problem 2

Suppose the following block diagram.

(a) If L has 5 LHP poles, 2 RHP poles, and 7 LHP zeros, is the closed-loop system stable for very large $K>0$?
(b) If L has 4 LHP poles, and 2 LHP zeros, is the closed-loop system stable for very large $K>0$?
(a) If $L$ has 5 LHP poles, 2 RHP poles, and 7 LHP zeros, is the closed-loop system stable for very large $K>0$?
(b) If L has 4 LHP poles, and 2 LHP zeros, is the closed-loop system stable for very large K>0?
Solution 2-Extra Space