ECE 486: Control Systems

Lecture 12A: Root Locus Rules DEF

Problem 1

Consider the following functions.

$$L = \frac{1}{s^2+2s+10}, \qquad L = \frac{s-3}{s^2+2s+10}, \qquad L = \frac{s+4}{s^5+1}$$

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

Problem 1A

Consider the following functions.

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

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

Problem 1B

Consider the following functions.

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

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

Problem 1C

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

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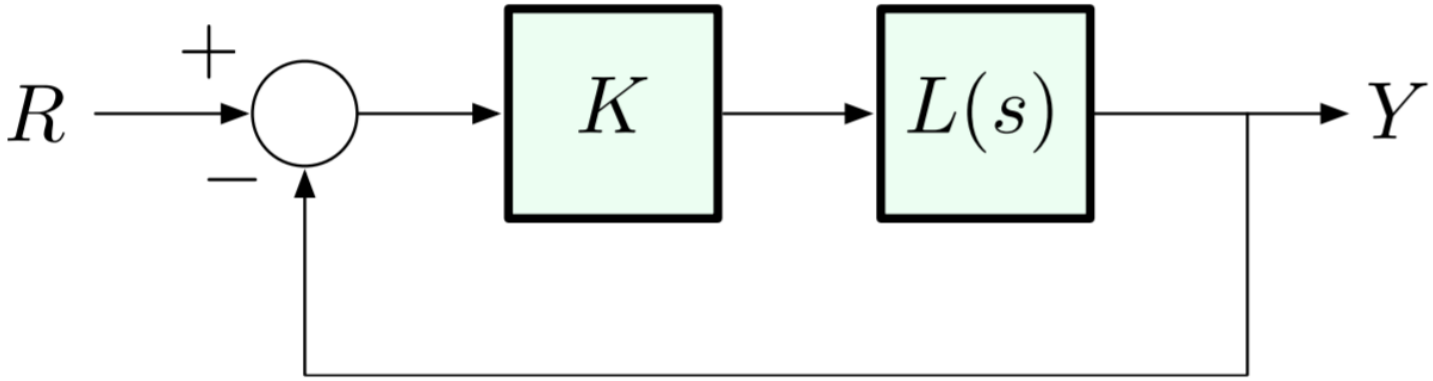
Lecture 12B: Case Study on Root Locus Design

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?

Problem 2A

(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?

Problem 2B

(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