16.06 Principles of Automatic Control

Problem Set 10

Issued: November 10, 2012
Due: November 16, 2012

Instructions: Do each problem on separate sheets of paper, and staple the sheets for each problem together. Write your name on each problem.

Problem 1

Do Problem 6.45 from FPE.

Problem 2

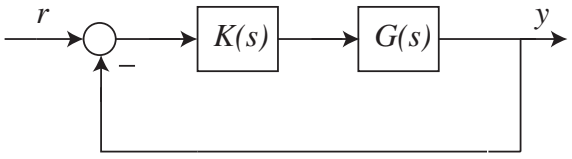
Do Problem 6.49 from FPE.

Problem 3

Do Problem 6.52 from FPE.

Problem 4

You are to design a compensator $K(s)$ for the unity feedback control system



where

$$G(s) = \frac{(1 - s/300)}{(1 + s/4)^2}$$

that meets the following specifications:

- Phase margin at least 40 deg
- Rise time as fast as is practical
- No excessive "undershoot," *i.e.*, wrong way behavior
- The steady error to a unit step input is less than 0.5%

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