KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

Department of Electrical Engineering

EE 380 - Exam II

(091)

December 28, 2009

1 Hour Exam

Student Name:

Student ID#:

Section #:

	Maximum score	**Score**
Problem 1	25	
Problem 2	25	
Problem 3	25	
Problem 4	25	
Problem 5	25	
Total	125	

Instructor Name: Dr. Jamil M. Bakhashwain

Problem 1

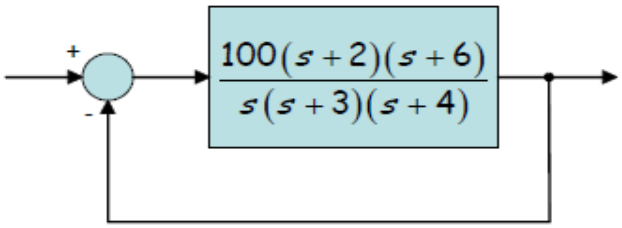
For the system shown below,

a) determine the system type (5 points)

b) find the steady-state error for

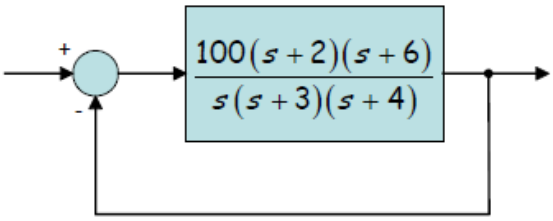
i) a unit step input (10 points)

ii) a unit ramp input (10 points)



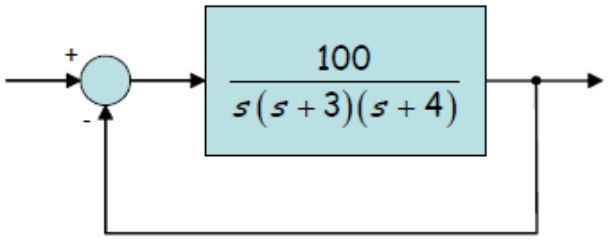
Problem 2

For the system below, use the Routh-Hurwitz criterion to determine if the system is stable. (25 points) Note: This method applies to the closed-loop transfer function.



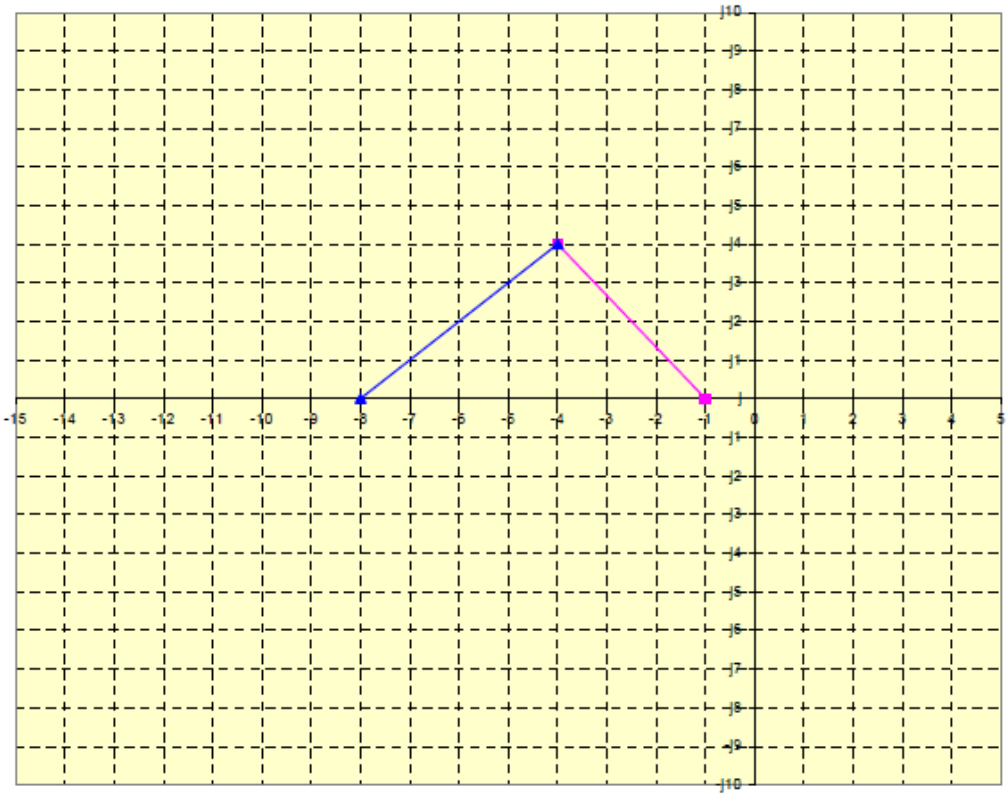
Problem 3

Given the system below, sketch the root locus of the system.
(25 points)



Problem 4

In the root locus below, the point s = -4 +j4 is desired. If the first two poles are at -1, and -8, determine the location of the third pole in the system. (25 points)



Problem 5

For the control system shown, find the values of K and K_t so that the maximum overshoot of the output is approximately 4.3% and the rise time t_r is approximately 0.2 sec.