

Quiz 3 EE 422G Spring 2007

Name: _____ Student ID: _____

This quiz is open book and open notes. Please do your own work.

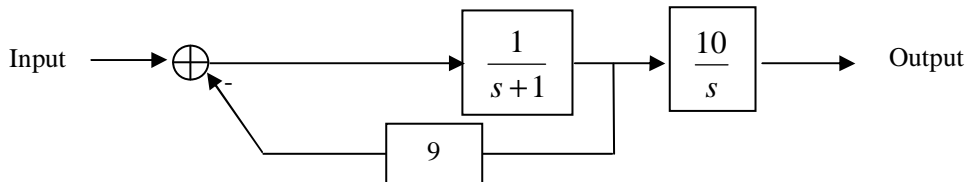
1. (4 pt) Fill in the missing two rows of the Routh Array that corresponds to the following transfer function AND determine the number of open-RHP poles

$$H(s) = \frac{1}{s^7 + 3s^6 + 3s^5 + s^4 + s^3 + 3s^2 + 3s + 1}$$

s^7	1	3	1	3
s^6	3	1	3	1
s^5	8/3	0	8/3	
s^4	1	0	1	
s^3	4	0		
s^2	ϵ	1		
s^1	-4/ ϵ	0		
s^0	1			

It has two open-RHP poles due to the two sign changes in the first column.

2. (4 pt) Compute the transfer function of the following block diagram.



It is a simple feedback loop followed by 10/s: $H(s) = \frac{1/(s+1)}{1+9/(s+1)} \frac{10}{s} = \frac{10}{s(s+10)}$

3. (2 pt) Name two applications of feedback systems.

- Approximate inverse system
- Build systems that are more robust towards component degradation
- Build systems that are more adaptive towards external changes