

# ECE311

## Homework 3

### Problem 1:

Determine the region of values for the parameter  $k$  so that the systems with the following characteristic equations are stable.

For each case, compute the critical frequency of oscillation  $\omega_c$ :

a.  $s^4 + 7s^3 + 15s^2 + (25 + k)s + 2k = 0$

b.  $s^3 + 3ks^2 + (k + 2)s + 4 = 0$

### Problem 2:

Change the following block diagram to a signal flow graph and subsequently determine the transfer function  $C/R$ .

