Homework #10: ECE 461

z-Transform. Converting G(s) to G(z). Due Monday, November 13th

1) X and Y are related as follows:

$$Y = \left(\frac{400}{(s+10)(s+20)} \right) X$$

a) What is the differential equation relating X and Y?

b) Determine y(t) assuming

$$x(t) = 2 + 3 \sin(4t)$$

2) X and Y are related as follows:

$$Y = \left(\frac{0.1z}{(z-0.9)(z-0.8)} \right) X$$

a) What is the difference equation relating X and Y?

b) Determine y(t) assuming

$$x(t) = 2 + 3 \sin(4t)$$

3) Assume

$$G(s) = \left(\frac{4}{(s+1)(s+3)} \right)$$

a) Determine a filter, G(z), which has approximately the same step respone as G(s). Assume T = 0.1 sec

b) Plot the step response of G(s) and G(z)

4) Assume

$$G(s) = \left(\frac{4}{(s+1+j4)(s+1-j4)} \right)$$

a) Determine a filter, G(z), which has approximately the same step respone as G(s). Assume T = 0.1 sec

b) Plot the step response of G(s) and G(z)

5) Assume

$$G(s) = 5 \left(\frac{s+0.5}{s+2} \right)$$

a) Determine a filter, G(z), which has approximately the same step respone as G(s). Assume T = 0.1 sec

b) Plot the step response of G(s) and G(z)