

ET 438a
Continuous and Digital Control
Open-loop, Close-loop and Error Ratio Calculations

1.) Draw the block diagrams for the each of the system transfer functions given below. Assume that the input signal is $X(s)$ and the output is $Y(s)$. All systems have negative feedback.

2.) Compute the open-loop gain, the closed loop gain, and the error ratio for each of the system transfer functions given below

a.)

$$G(s) = \frac{2s+1}{s^2+4s+1} \quad H(s) = 0.5$$

b.)

$$G(s) = \frac{1}{(s+2)(s+4)} \quad H(s) = \frac{0.5}{1+0.02s}$$

c.)

$$G(s) = \frac{5}{s^3+3s^2+2s+10} \quad H(s) = 5$$