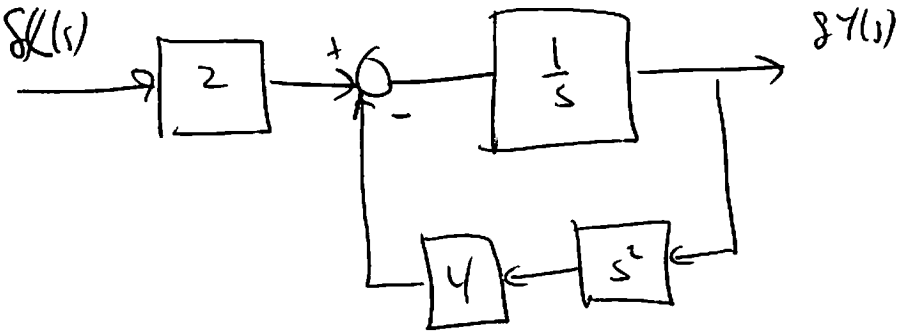
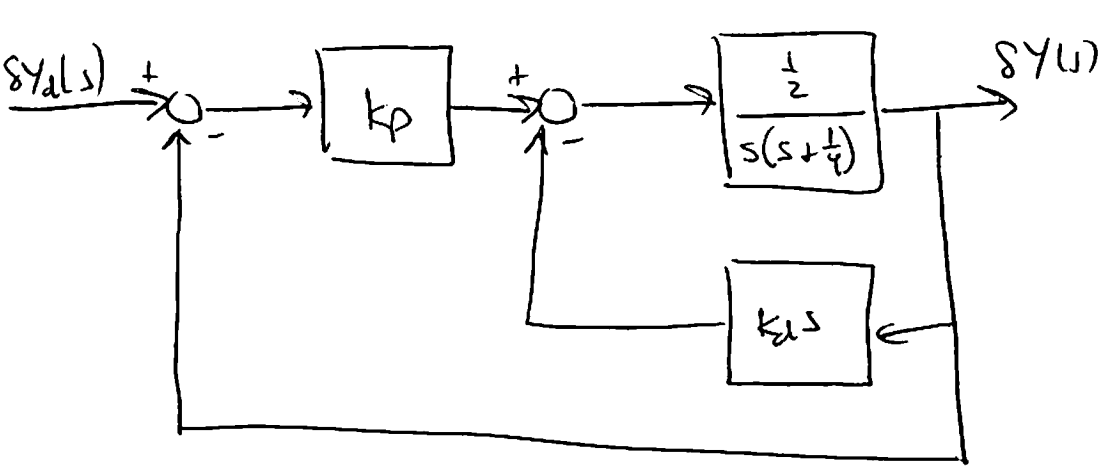
(a)

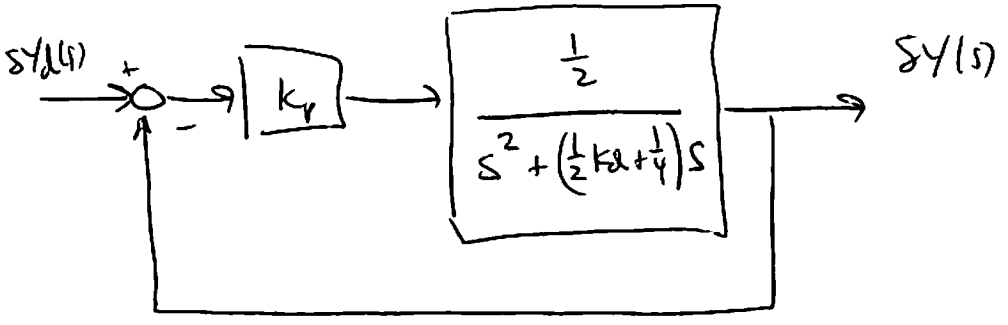


$$\frac{\delta Y(s)}{\delta X(s)} = 2 \cdot \frac{\frac{1}{s}}{1 + \frac{4s^2}{s}} = \frac{2}{4s^2 + s} = \frac{\frac{1}{2}}{s\left(s + \frac{1}{4}\right)}$$

(b)



(c)



$$\frac{\delta Y(s)}{\delta Y_d(s)} = \frac{\frac{1}{2}k_p}{s^2 + \underbrace{\left(\frac{1}{2}k_d + \frac{1}{4}\right)}_{2\zeta\omega_n} s + \underbrace{\frac{1}{2}k_p}_{\omega_n^2}}$$