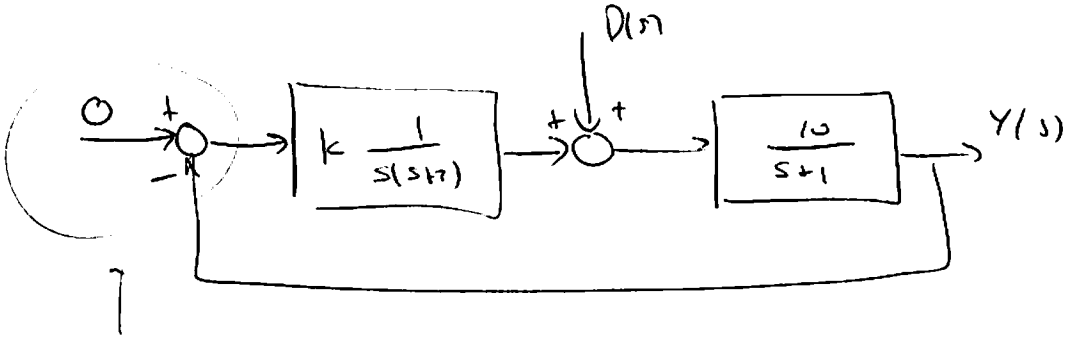
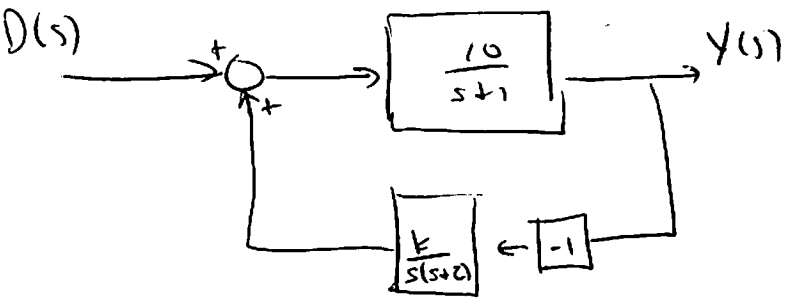
(4)

Transfer function from $D(s)$ to $Y(s)$: Set $R(s) = 0$




replace with $-1$




$$\frac{Y(s)}{D(s)} = \frac{\frac{10}{s+1}}{1 - \frac{-K}{s(s+2)}\frac{10}{s+1}} = \frac{10\,s(s+2)}{s(s+2)(s+1) + 10K}$$

$$= \frac{10\,s(s+2)}{s^3 + 3s^2 + 2s + 10K}$$