

1. Problem 10.8

2. Problem 10.10

3. Problem 11.2

(a)

$$Y(s) \frac{1 - M(s)Q(s) + Q(s)G(s)}{1 - M(s)Q(s)} = \frac{Q(s)G(s)}{1 - M(s)Q(s)} Y_{sp}(s) + W(s)G'(s)$$

(b)

$$\begin{aligned} Y(s) (1 + C_E(s)G(s) - C_Y(s)G(s)) &= C_E(s)G(s)Y_{sp}(s) + W(s)G'(s) \\ Y(s) &= \frac{C_E(s)G(s)}{(1 + C_E(s)G(s) - C_Y(s)G(s))} Y_{sp}(s) \\ &\quad + \frac{W(s)}{(1 + C_E(s)G(s) - C_Y(s)G(s))} G'(s) \end{aligned}$$

(c)

$$Y(s) = \frac{G'(s) + G(s)G_{ff}(s)}{1 + G_c(s)G(s)} W(s) + \frac{G_c(s)G(s)}{1 + G_c(s)G(s)} Y_{sp}(s)$$

4. Problem 11.8