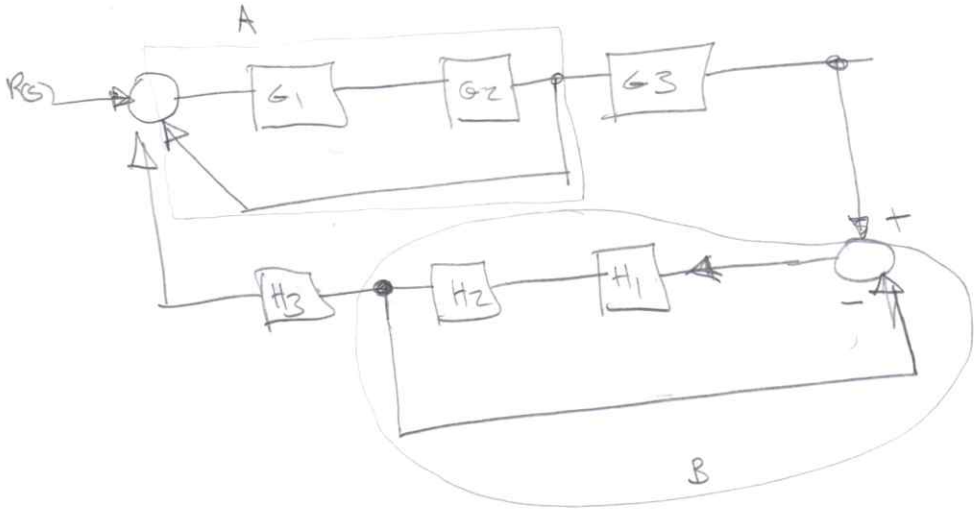
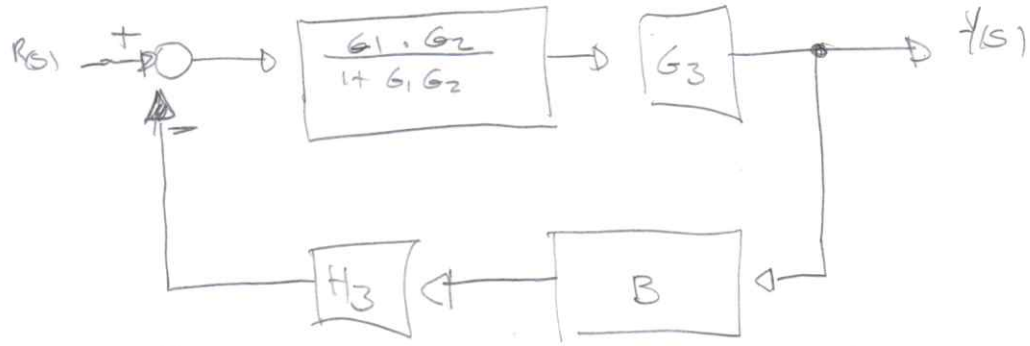
f)



see case other way around.

$$A = \frac{G1 \cdot G2}{1 + G1\,G2}$$

$$B = \frac{H_1\,H_2}{1 + H_1\,H_2}$$



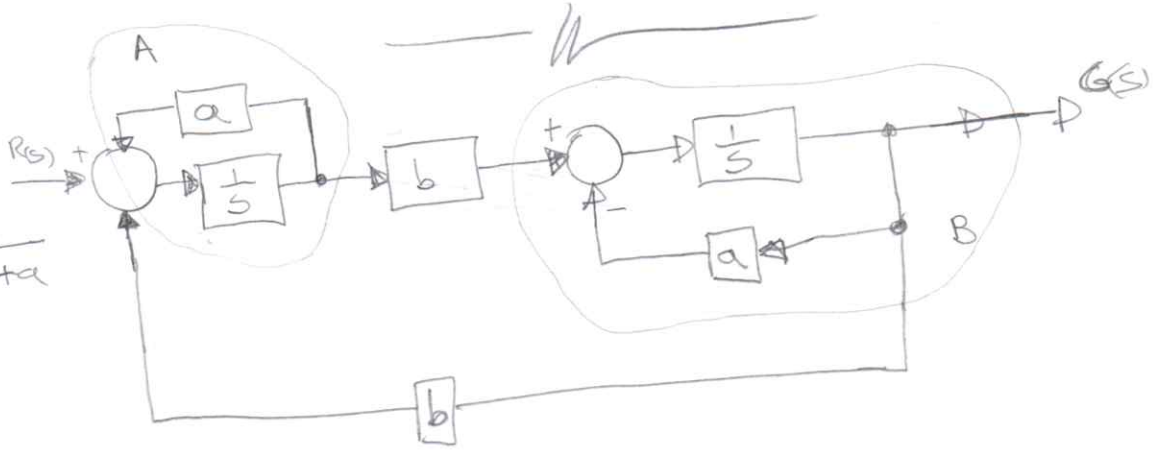
$$\frac{Y(s)}{R(s)} = \frac{\frac{G_1 G_2}{1+G_1 G_2} \cdot G_3}{1 + \frac{G_1 G_2 G_3}{1+G_1 G_2} \cdot \frac{H_1 H_2 H_3}{1+H_1 H_2}}$$

common denominador

$$= \frac{\frac{G_1 G_2 G_3}{(1+G_1 G_2)}}{\frac{1+G_1 G_2 \cdot (1+H_1 H_2) + G_1 G_2 G_3 \cdot H_1 \cdot H_2 \cdot H_3}{(1+G_1 G_2)\cdot(1+H_1 H_2)}}$$

$$= \frac{(1+H_1 H_2)\, G_1 G_2 G_3}{(1+G_1 G_2)(1+H_1 H_2) + G_1 G_2 G_3 H_1 H_2 H_3}$$

j)



$$\frac{\frac{1}{5} \times S}{1 + \frac{1}{5} \cdot a \times S} = \frac{1}{s+a}$$

$$A = \frac{1}{s+a}$$

$$B = \frac{1}{s+a}$$