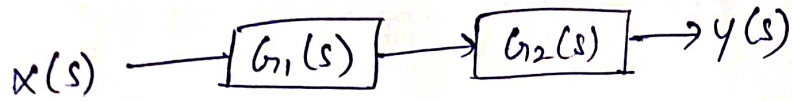
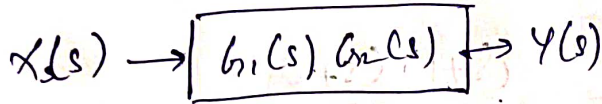


# Block diagram reduction technique.

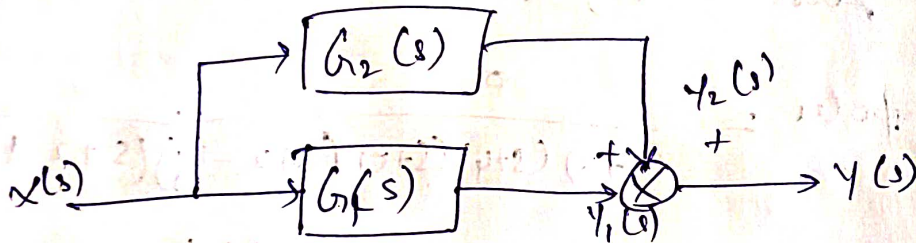
Rule 1 For serially connected blocks.



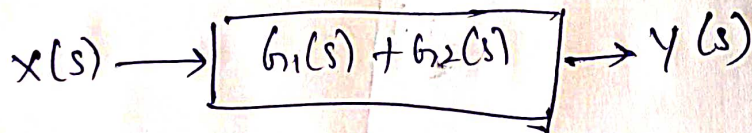
$$Y(s) = X(s) [G_1(s) G_2(s)]$$



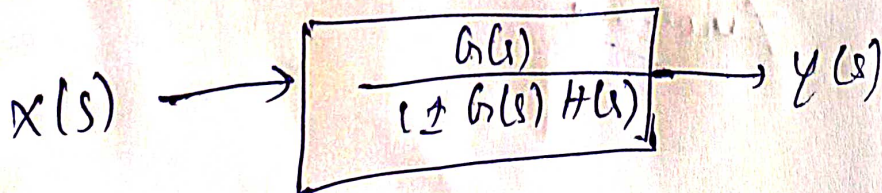
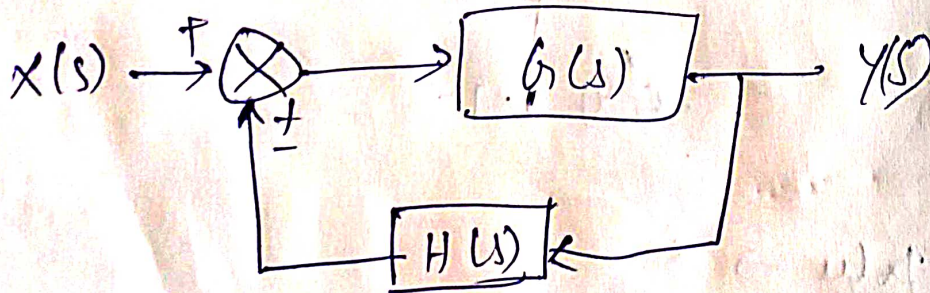
Rule 2 For parallel connected blocks.



$$Y(s) = X(s) [G_1(s) + G_2(s)]$$

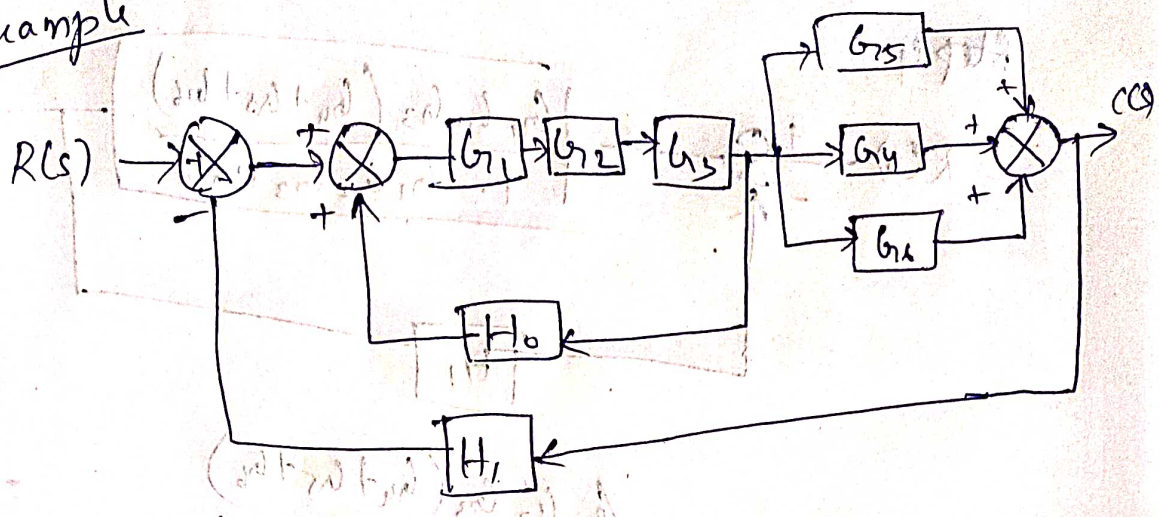


Rule 3 Eliminating feedback loop

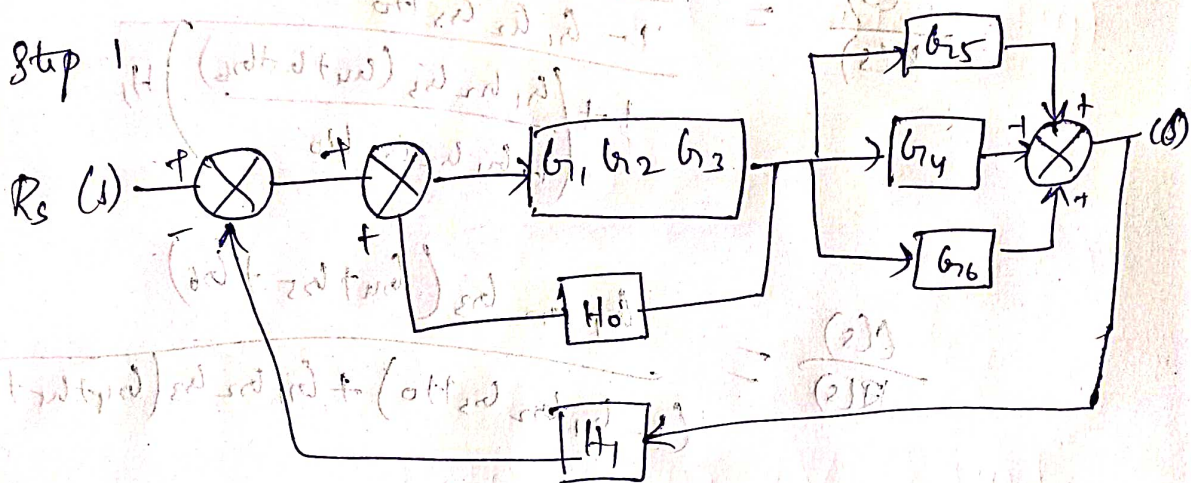




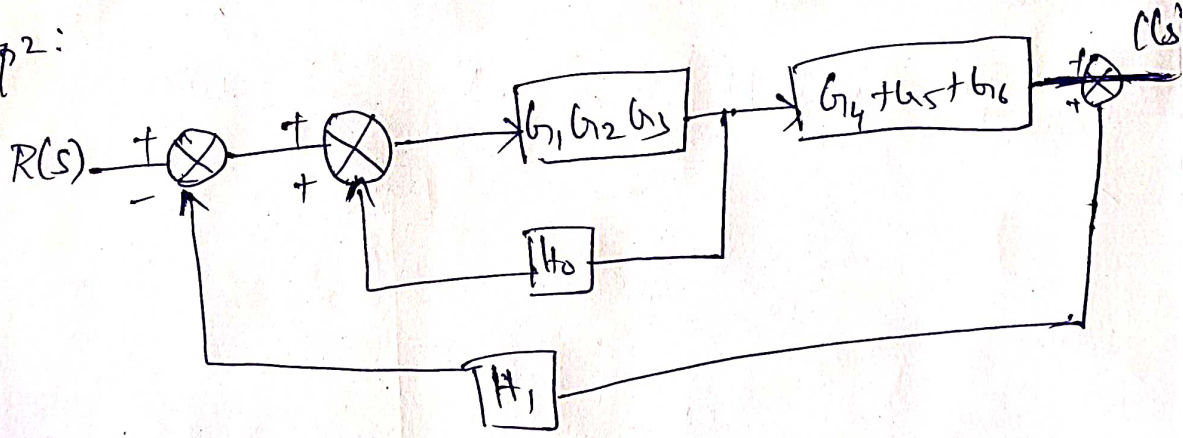
Example



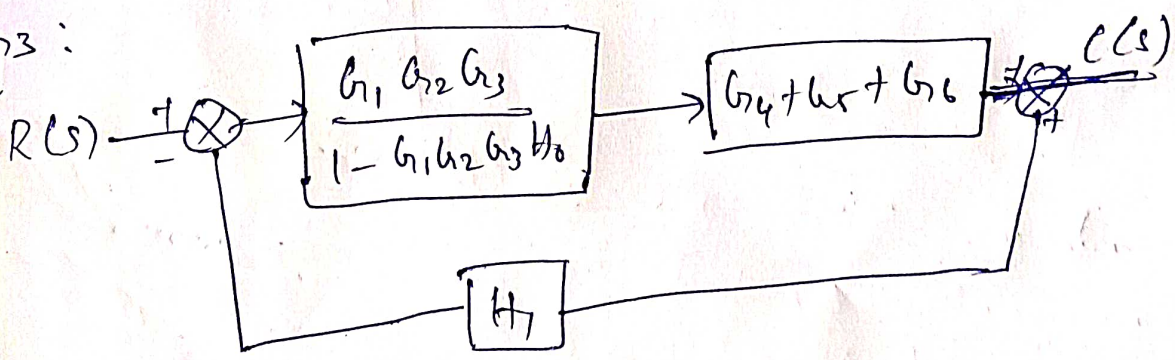
Step 1



Step 2:

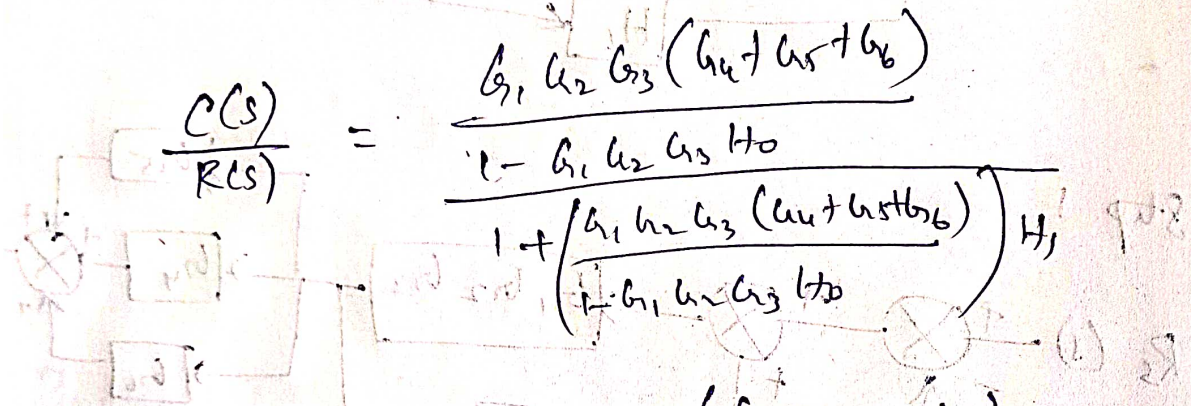
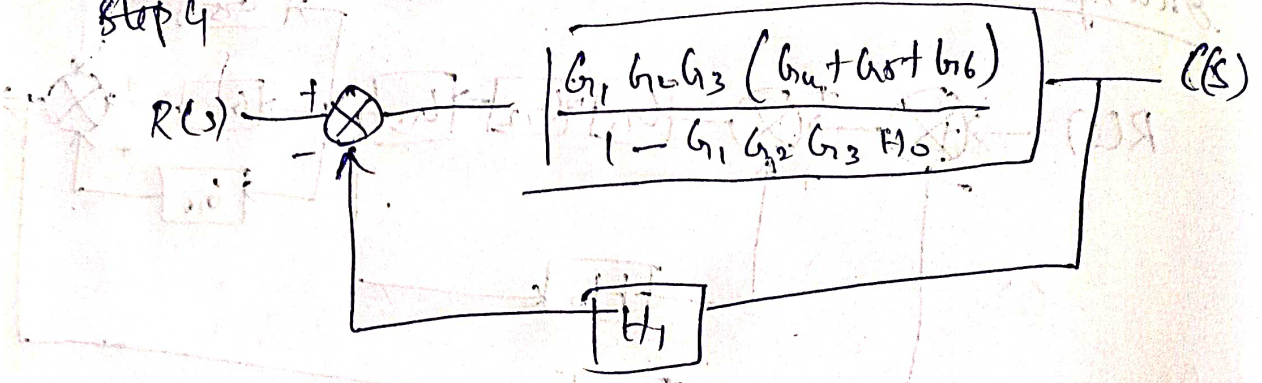


Step 3:



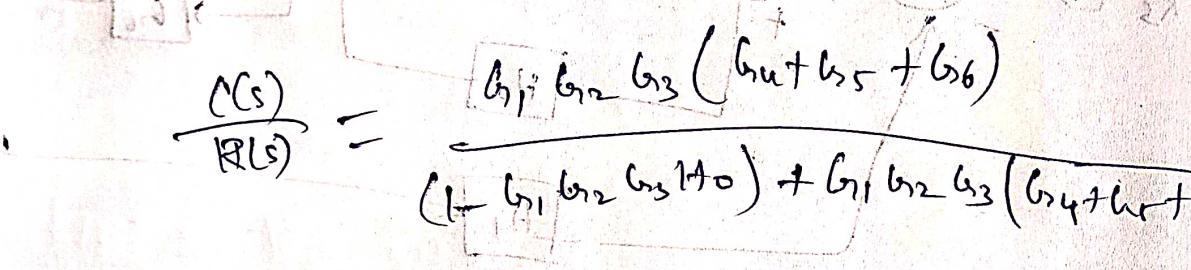


Step 4



$$\frac{C(s)}{R(s)}$$

$$= \frac{G_1 G_2 G_3 (G_4 + G_5 + G_6)}{1 - G_1 G_2 G_3 H_0}$$



$$\frac{C(s)}{R(s)}$$

$$= \frac{G_1 G_2 G_3 (G_4 + G_5 + G_6)}{(1 - G_1 G_2 G_3 H_0) + G_1 G_2 G_3 (G_4 + G_5 + G_6) H_1}$$

