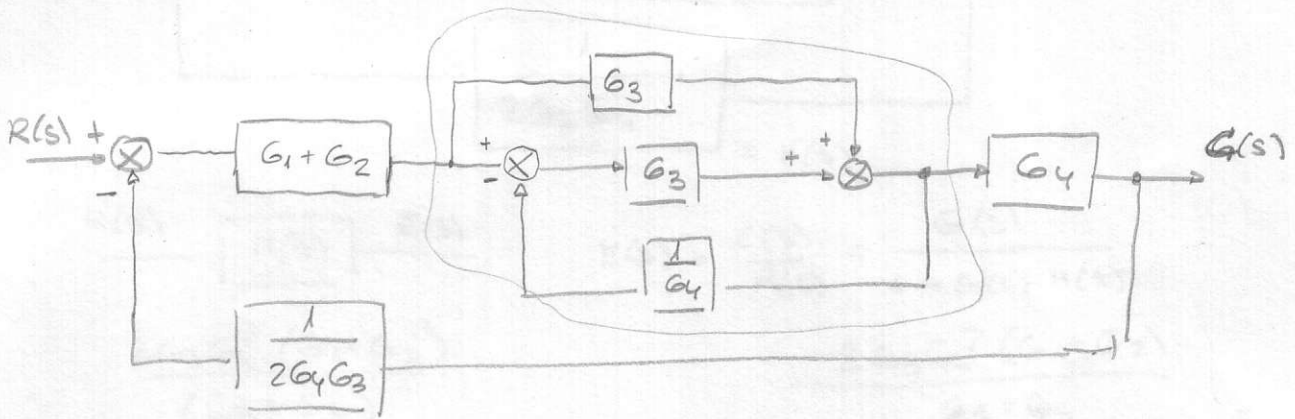
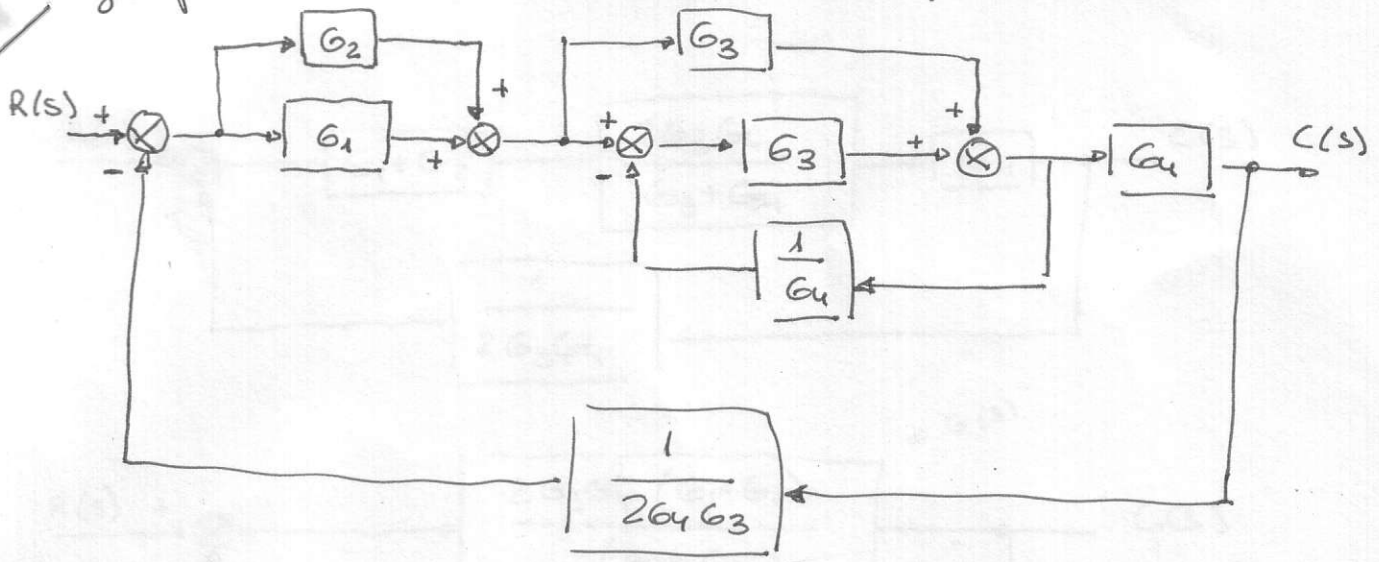
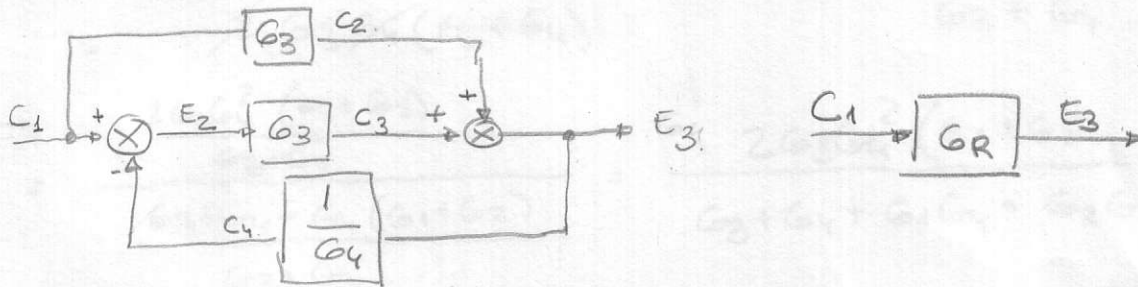


Ejemplo Ed. delestianna PAG. 230.



Resolvamos el bloque intermedio



$$E_2 = C_1 - C_4$$

$$C_2 = G_3 \cdot C_1$$

$$C_3 = G_3 \cdot E_2$$

$$E_3 = C_2 + C_3$$

$$C_4 = \frac{E_3}{G_4}$$

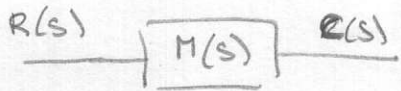
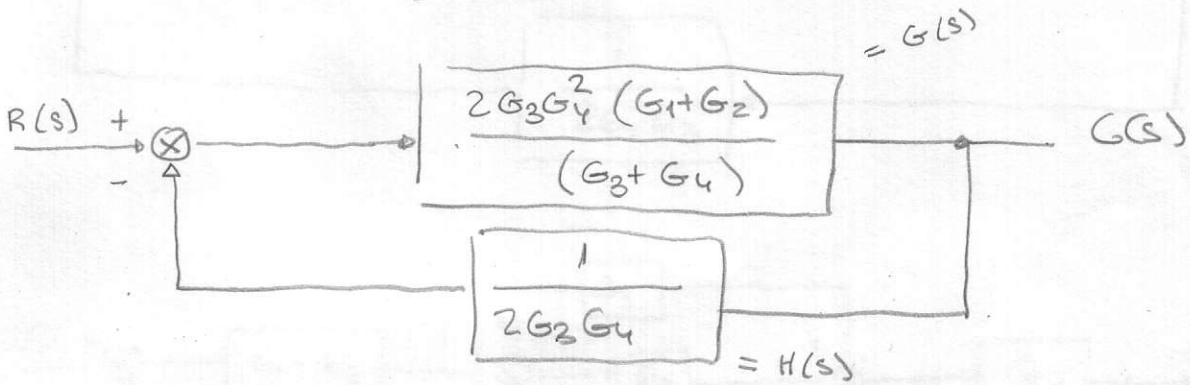
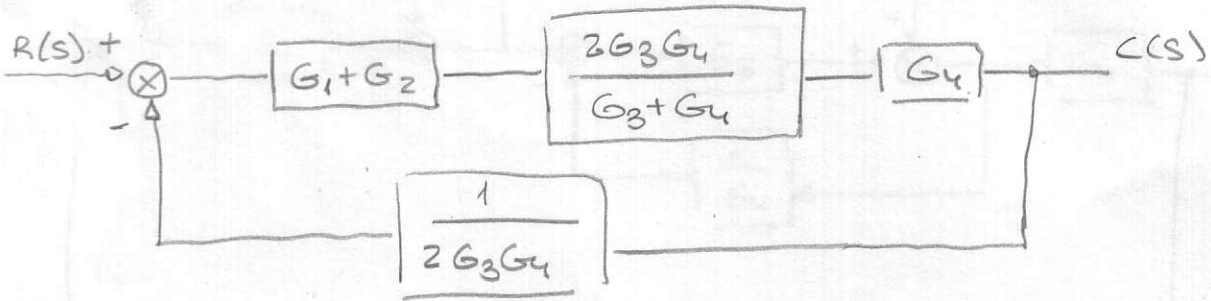
$$\frac{C_2}{G_3} = \frac{C_1}{E_2} \Rightarrow C_1 \cdot C_3 = C_2 \cdot E_2$$

$$E_3 = G_3 \cdot C_1 + G_3 \cdot E_2 = G_3 \cdot C_1 + G_3 \cdot (C_1 - C_4)$$

$$E_3 = G_3 [C_1 + C_1 - C_4] = G_3 (2C_1 - C_4)$$

$$E_3 = G_3 \left(2C_1 - \frac{E_3}{G_4} \right) = G_3 \cdot 2C_1 - \frac{G_3 E_3}{G_4} \Rightarrow E_3 \left(1 + \frac{G_3}{G_4} \right) = 2G_3 C_1$$

$$\frac{E_3}{C_1} = \frac{2G_3}{1 + G_3/G_4} \Rightarrow \boxed{\frac{E_3}{C_1} = \frac{2G_3 \cdot G_4}{G_4 + G_3}} \Rightarrow \boxed{G_R = \frac{2G_3 \cdot G_4}{G_4 + G_3}}$$



$$M(s) = \frac{C(s)}{R(s)} = \frac{G(s)}{1 + G(s) \cdot H(s)}$$

$$H(s) = \frac{\frac{2G_3G_4^2(G_1+G_2)}{(G_3+G_4)}}{1 + \frac{2G_3G_4^2(G_1+G_2)}{2G_3G_4(G_3+G_4)}}$$

$$= \frac{\frac{2G_3G_4^2(G_1+G_2)}{(G_3+G_4)}}{1 + \frac{G_4(G_1+G_2)}{G_3+G_4}}$$

$$= \frac{\frac{2G_3G_4^2(G_1+G_2)}{G_3+G_4}}{\frac{G_3+G_4 + G_4(G_1+G_2)}{G_3+G_4}}$$

$$= \frac{2G_3G_4^2(G_1+G_2)}{G_3+G_4 + G_1G_4 + G_2G_4}$$

$$= \frac{2G_3G_4^2(G_1+G_2)}{G_4 \left(\frac{G_3}{G_4} + 1 + G_1 + G_2 \right)}$$

$$\boxed{\frac{2G_3G_4^2(G_1+G_2)}{1 + \frac{G_3}{G_4} + G_1 + G_2}}$$