TEMA 3
REPRESENTACION EXTERNA DE SISTEMAS

EJERCICIO 3.1

R(s) → $$\dfrac{K\,G_1(G_2 + G_2 G_3 + 1)}{1 + G_2 + G_1 F + G_1(G_2 + G_2 G_3 + 1)}$$ → Y(s)
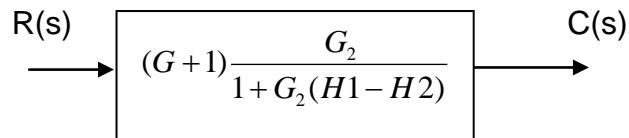
EJERCICIO 3.2

R(s) → $$\dfrac{K\,G_1(G_2 G_3 + 1)}{1 + G_2 + G_1 F_1 + G_1(G_2 G_3 + 1)}$$ → Y(s)

EJERCICIO 3.3

R(s) → $$(G + 1)\dfrac{G_2}{1 + G_2(H1 - H2)}$$ → C(s)
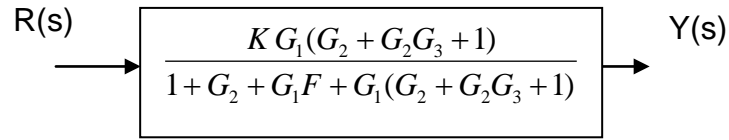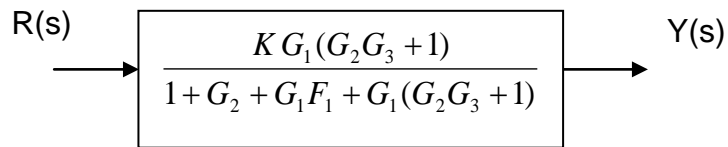
EJERCICIO 3.4

$$C(s) = \frac{G_C G_1 G_2 G_3}{1 + G_1 G_2 H_1 + G_C G_1 G_2 G_3 H_2} R(s) + \frac{G_2 G_3}{1 + G_1 G_2 G_3 G_C H_2 + G_1 G_2 H_1} D(s)$$

EJERCICIO 3.5

a)

$$G(s) = \frac{Eo(s)}{Ei(s)} = -\frac{R2}{R1}$$

b)

$$G(s) = \frac{Eo(s)}{Ei(s)} = -\frac{1}{R1\,C\,s}$$

c)

$$G(s) = \frac{Eo(s)}{Ei(s)} = \frac{(1 + R1\,C1\,s)(1 + R2\,C2\,s)}{R1\,C2\,s + (1 + R1\,C1\,s)(1 + R2\,C2\,s)}$$

EJERCICIO 3.6

$$\frac{Y(s)}{U(s)} = \frac{bs + k}{m\,s^2 + bs + k}$$

EJERCICIO 3.7

$$\theta_{\mathrm{o}}(s) = \frac{\frac{1}{H_1}(T_{\mathrm{i}}T_{\mathrm{d}}s^2 + T_{\mathrm{i}}s + 1)\theta_{\mathrm{d}}(s) + \frac{T_{\mathrm{i}}s(1+T_1 s)}{K_{\mathrm{F}}H_1}\theta_{\mathrm{s}}(s)}{\left(\frac{T_{\mathrm{i}}T_1 T_2}{K_{\mathrm{F}}H_1}\right)s^3 + \left(\frac{T_{\mathrm{i}}(T_1+T_2)}{K_{\mathrm{F}}H_1} + T_{\mathrm{i}}T_{\mathrm{d}}\right)s^2 + T_{\mathrm{i}}\left(\frac{1}{K_{\mathrm{F}}H_1} + 1\right)s + 1}$$

donde $T_2 = R_T C_T$ y $K_F = K_1 K_2 K_3 R_T$.

EJERCICIO 3.8

a)

$$y = 2.4x - 3.2$$

b)

$$z = 94x + 90y - 636$$