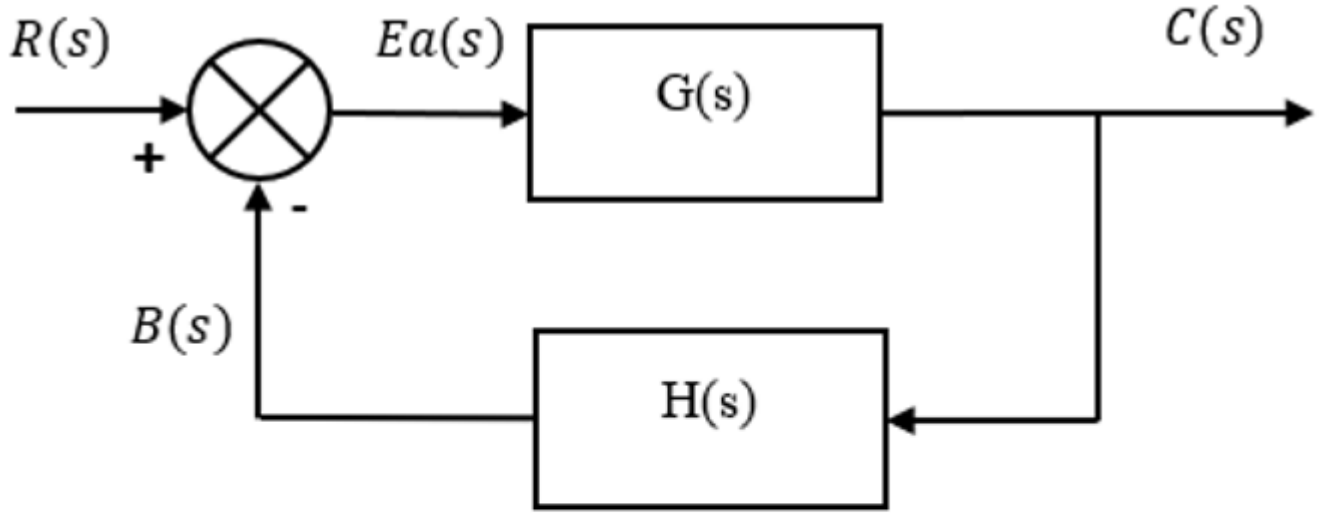
SISTEMAS DE CONTROL

- **Docente de teoría:**
  - **Ing. Emmanuel Vázquez**
- **Auxiliar de trabajos prácticos**
  - **Ing. Claudio Lauxmann**

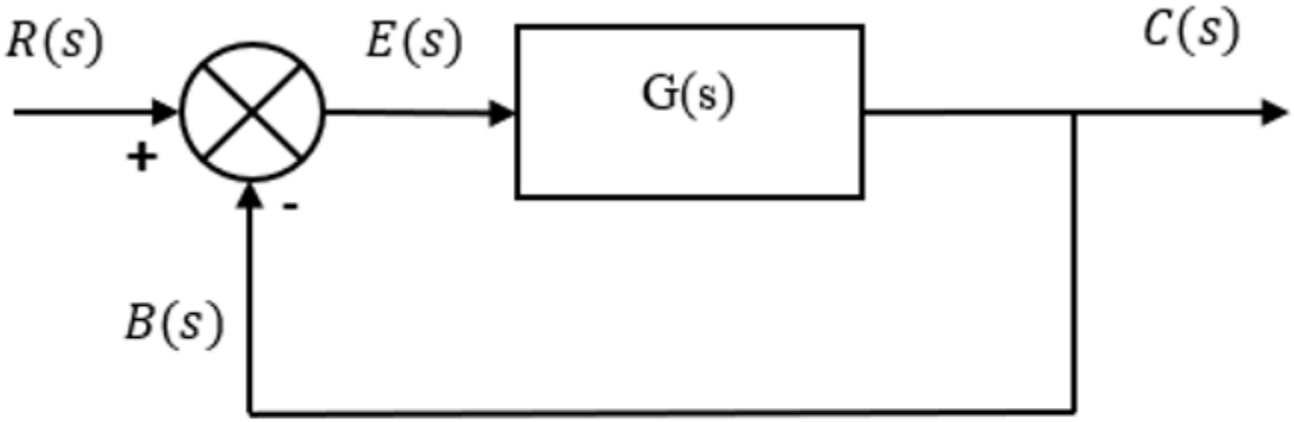
DIAGRAMAS DE BLOQUES



$$FTLC = \frac{FTD}{1 + \text{FTLA}}$$

$$FT = \frac{G(s)}{1 + \text{G(s)H(s)}}$$

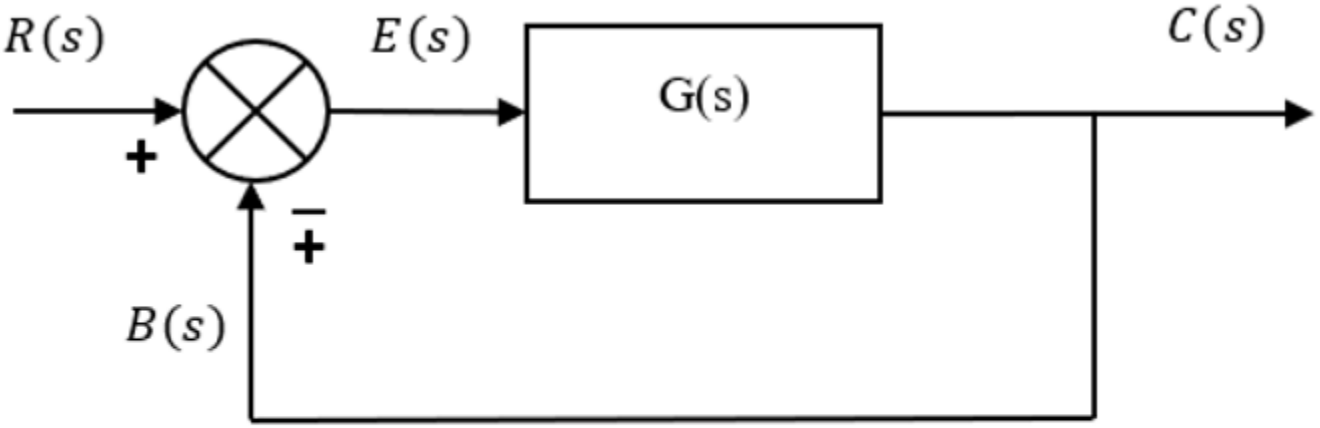
DIAGRAMAS DE BLOQUES



$$FTLC = \frac{FTD}{1 + \text{FTLA}}$$

$$FT = \frac{G(s)}{1 + \text{G(s)}}$$

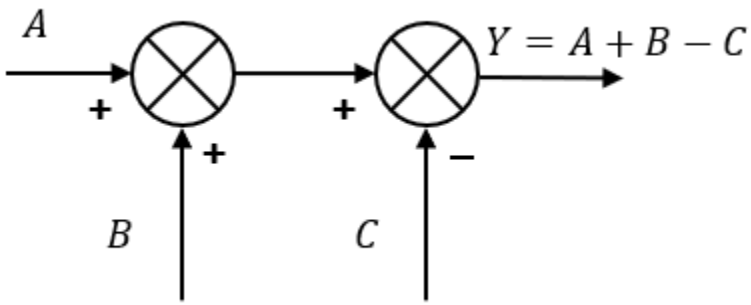
DIAGRAMAS DE BLOQUES

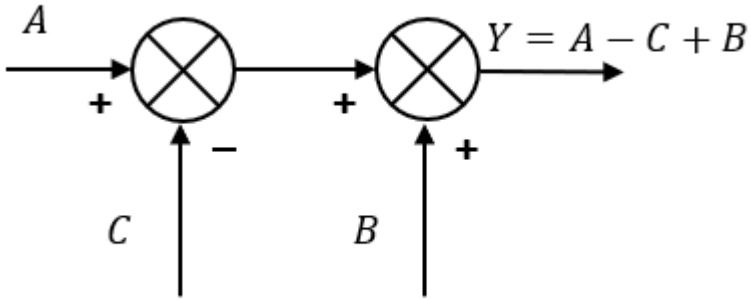


$$FT = \frac{G(s)}{1 \pm G(s)}$$

DIAGRAMAS DE BLOQUES

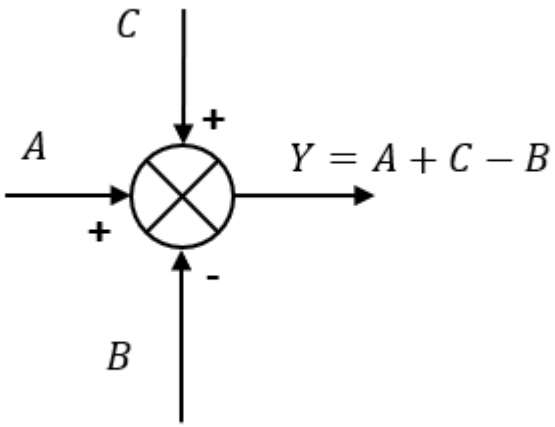
- **Propiedad conmutativa**

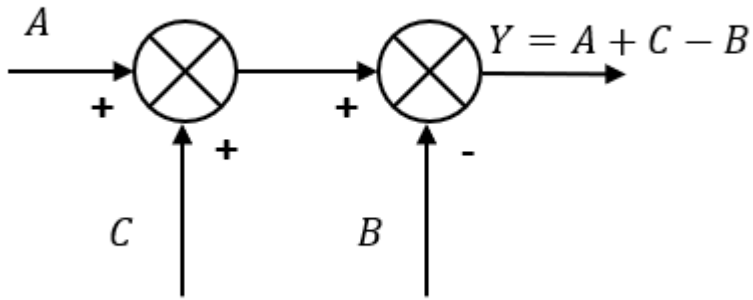




DIAGRAMAS DE BLOQUES

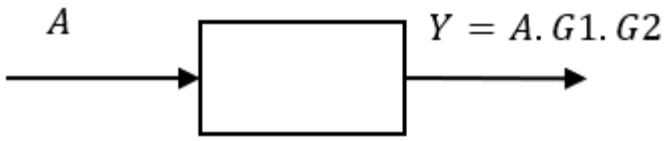
- **Propiedad distributiva**





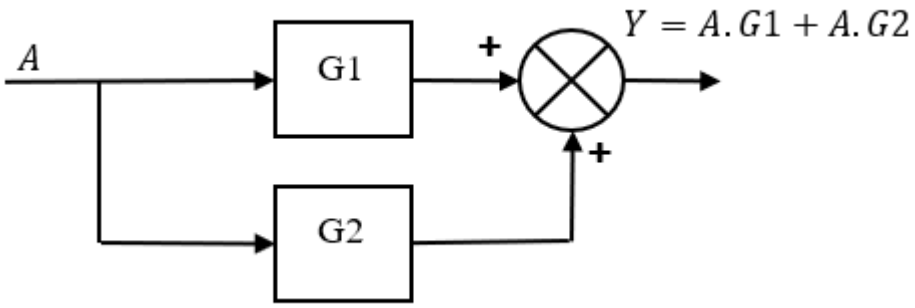
DIAGRAMAS DE BLOQUES

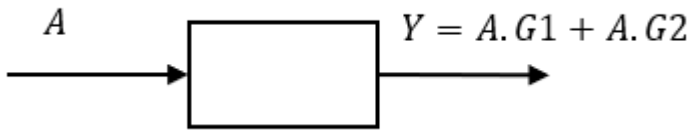
- **Propiedad asociativa**



DIAGRAMAS DE BLOQUES

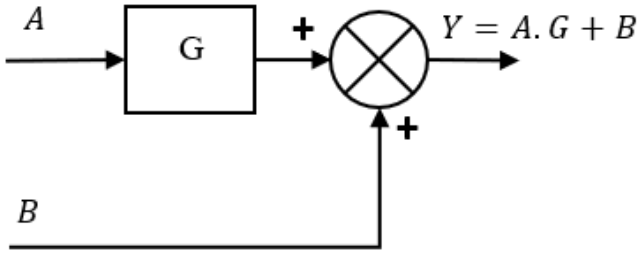
- **Bloques en paralelo**

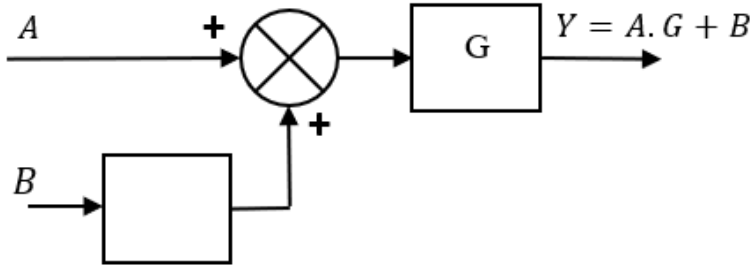




DIAGRAMAS DE BLOQUES

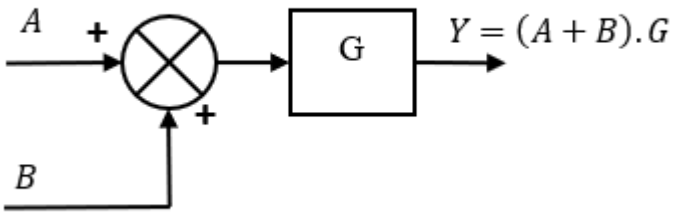
- **Mover punto de suma a la izquierda**

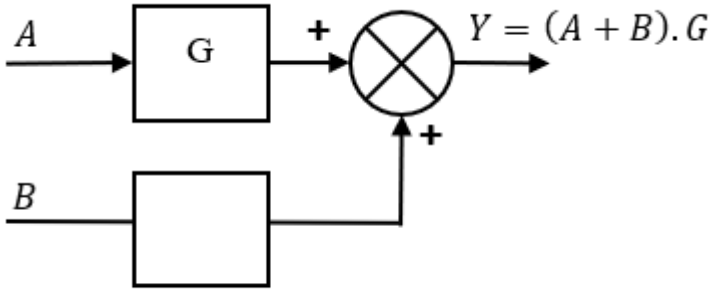




DIAGRAMAS DE BLOQUES

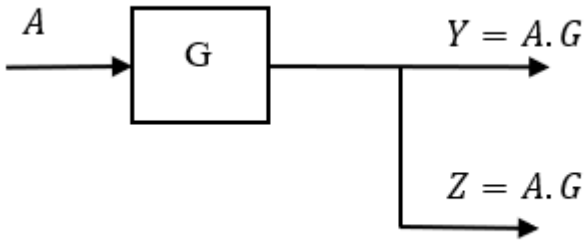
- **Mover punto de suma a la derecha**

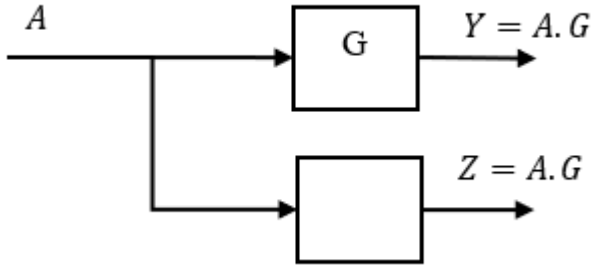




DIAGRAMAS DE BLOQUES

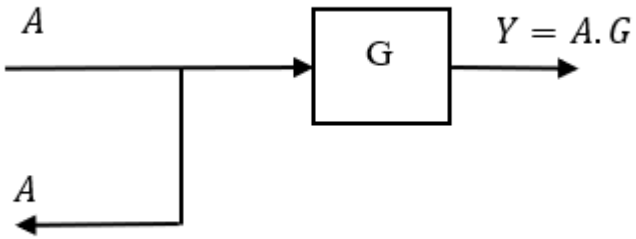
- **Mover punto de toma a la izquierda**

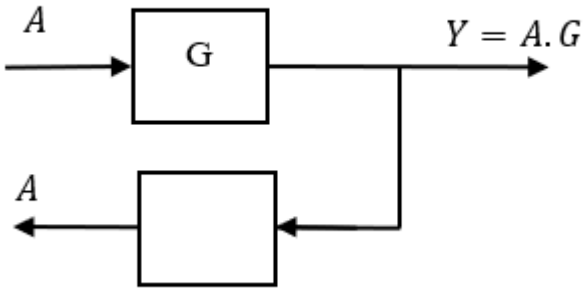




DIAGRAMAS DE BLOQUES

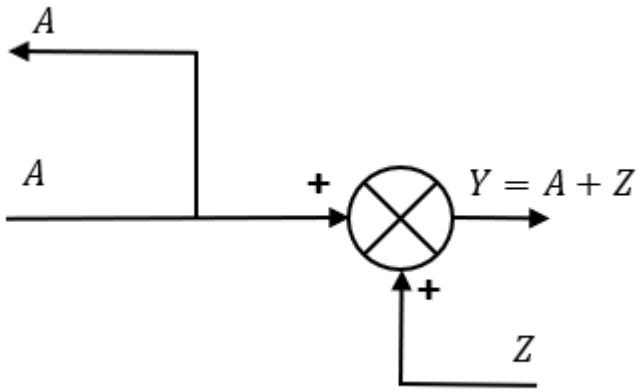
- **Mover punto de toma a la derecha**

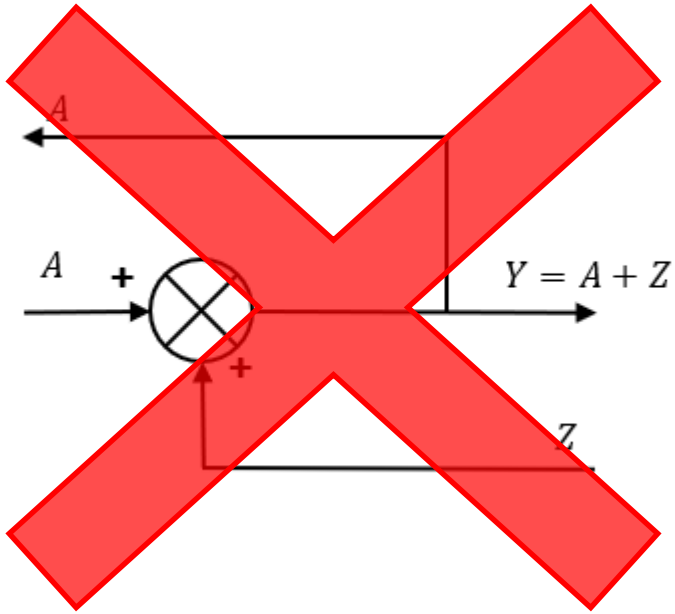




DIAGRAMAS DE BLOQUES

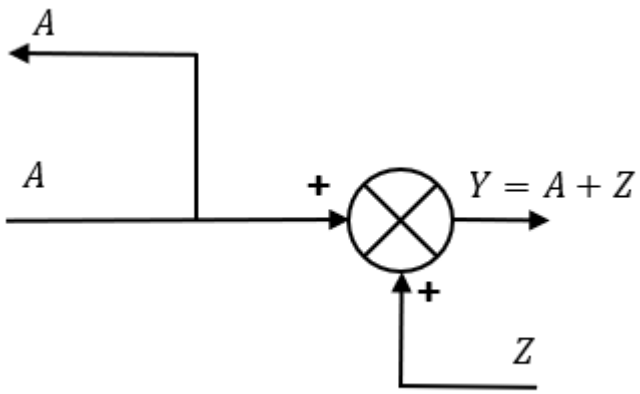
- **Intercambiar punto de suma por punto de toma**

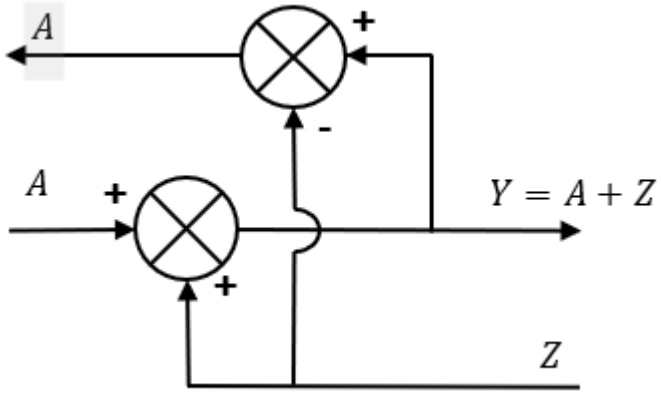




DIAGRAMAS DE BLOQUES

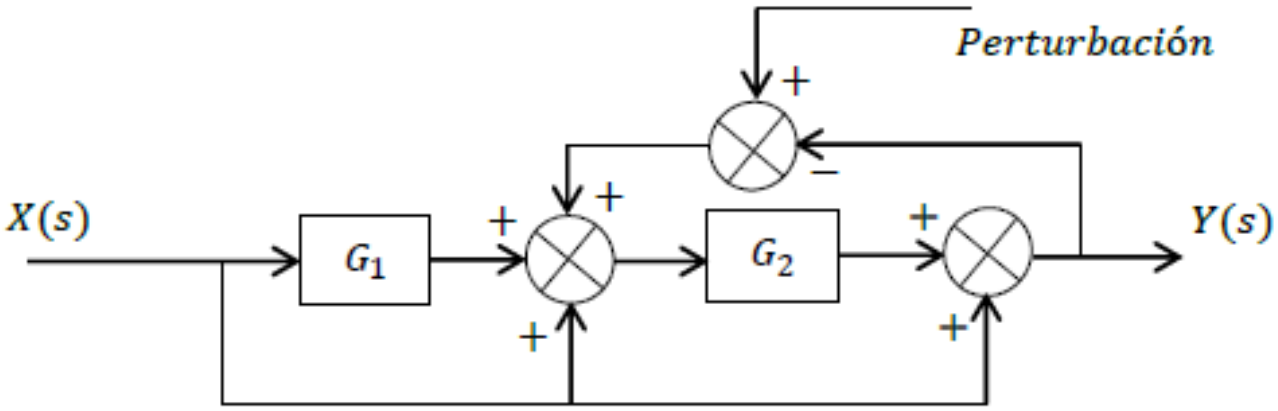
- **Intercambiar punto de suma por punto de toma**





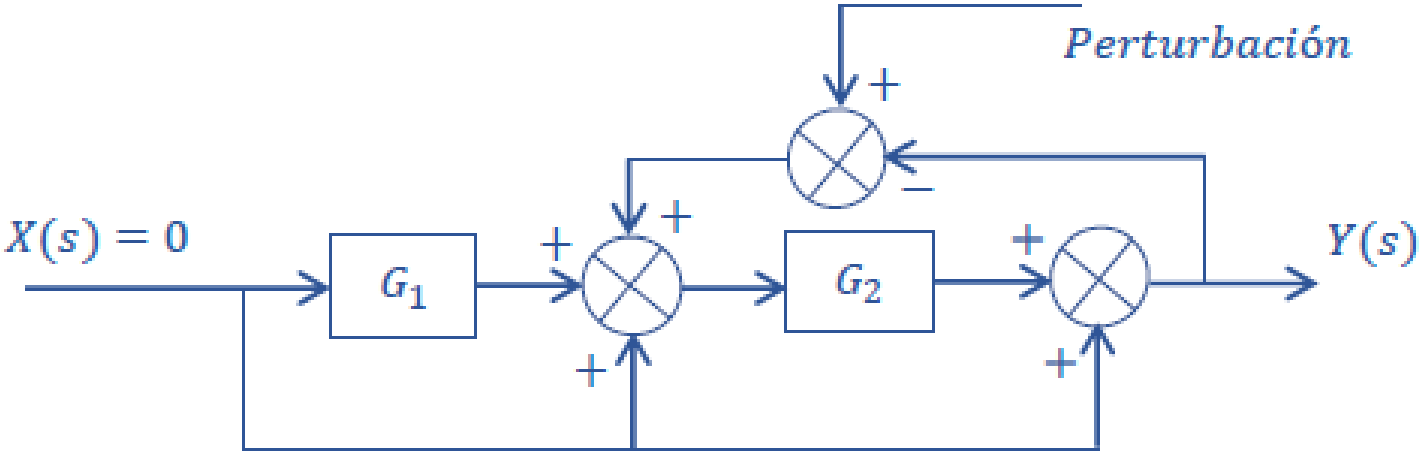
Ejemplo

- **Determinar Y(s)**



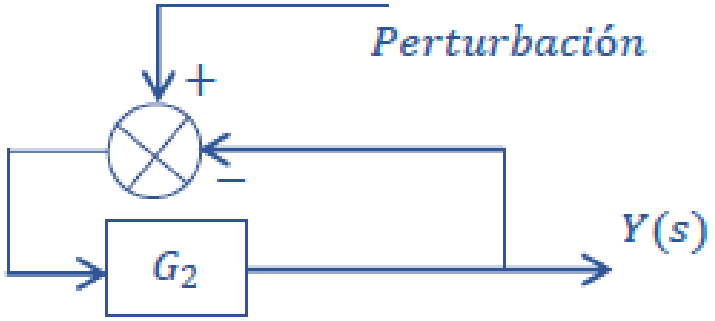
Ejemplo

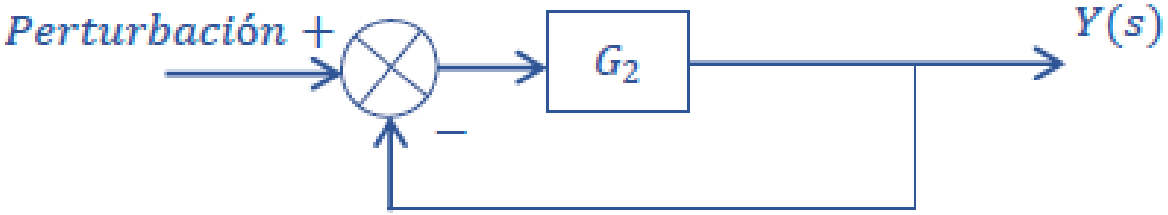
- **Hallamos Yp(s)**



Ejemplo

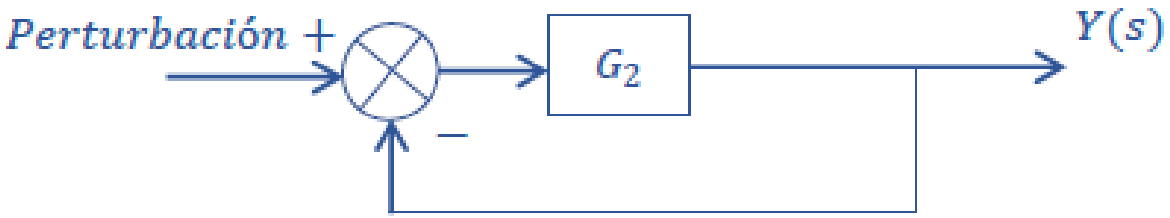
- **Hallamos Yp(s)**





Ejemplo

- **Hallamos Yp(s)**

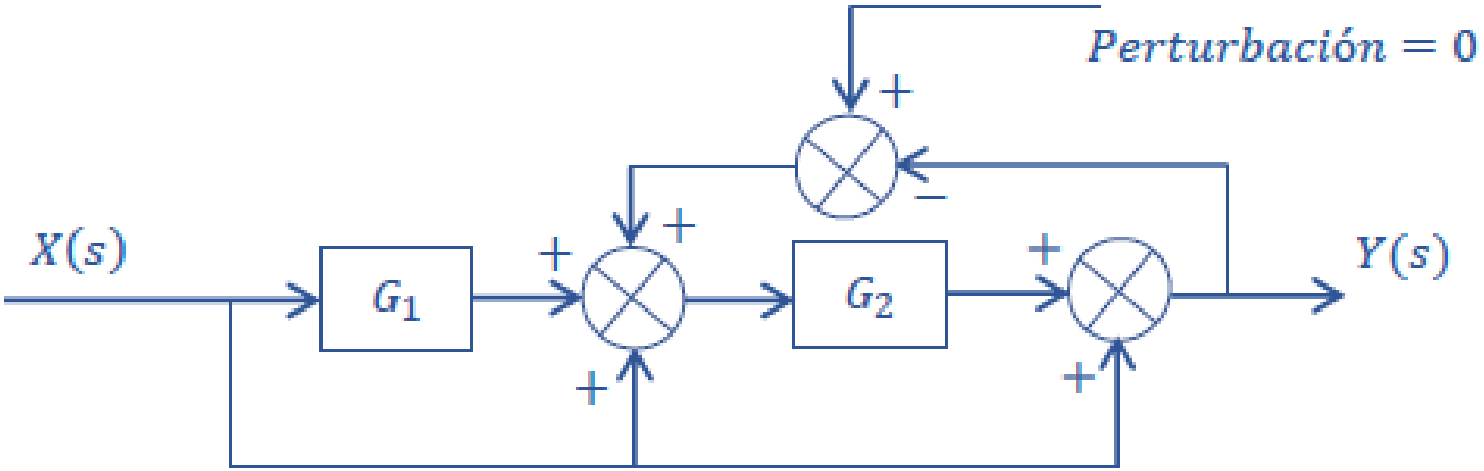


$$FT = \frac{G2}{1 + G2}$$

$$Yp(s) = Perturbación \frac{G2}{1 + G2}$$

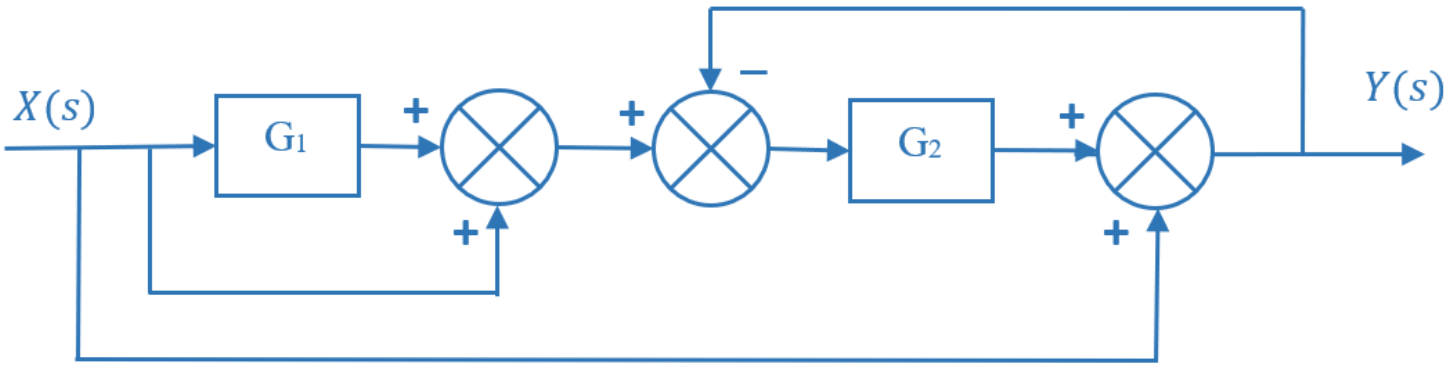
Ejemplo

- **Hallamos Yx(s)**



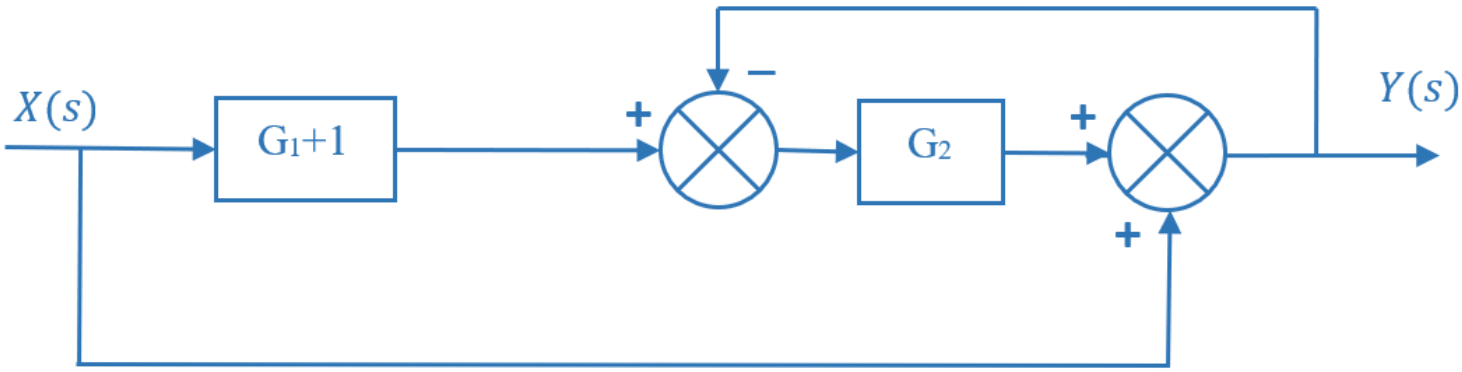
Ejemplo

- **Hallamos Yx(s)**



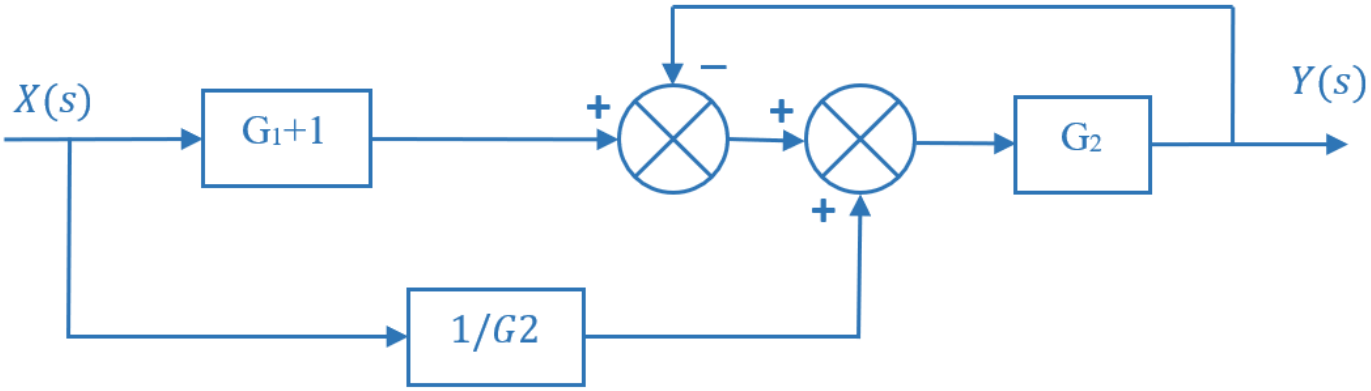
Ejemplo

- **Hallamos Yx(s)**



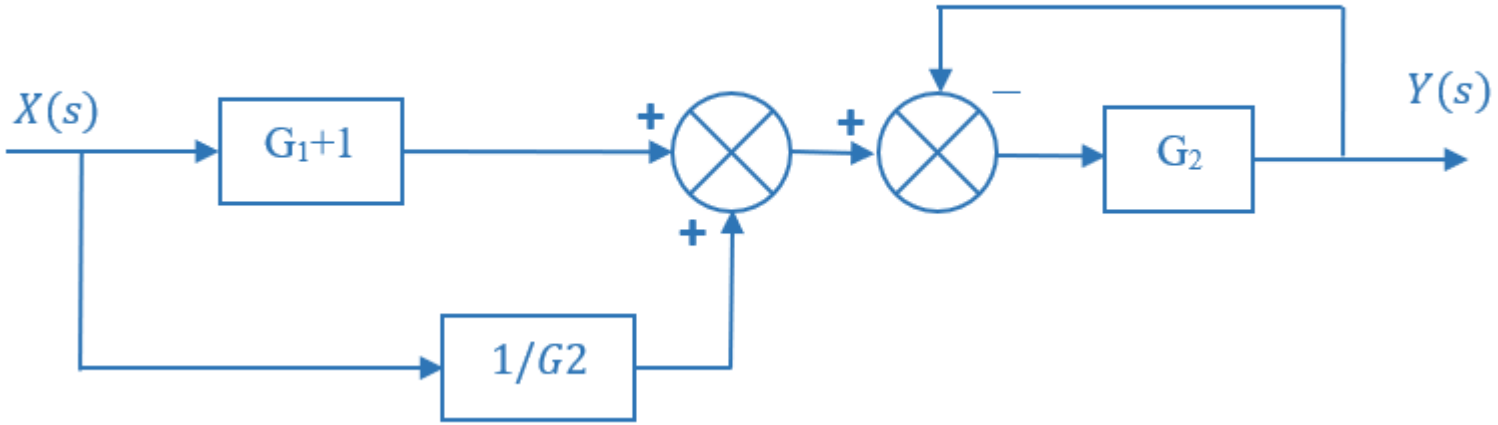
Ejemplo

- **Hallamos Yx(s)**



Ejemplo

- **Hallamos Yx(s)**



Ejemplo

- **Hallamos Yx(s)**

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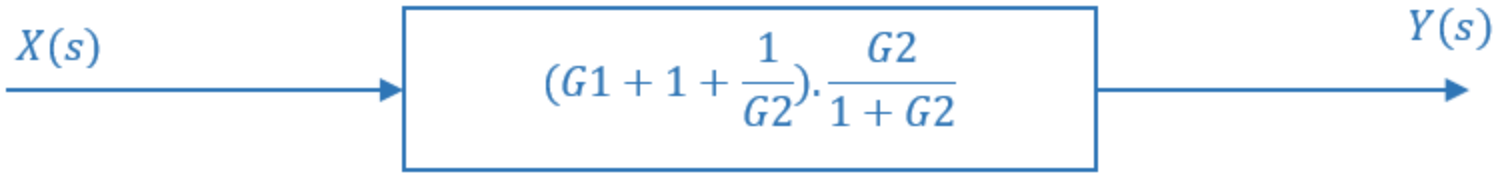


$$Yx(s) = X(s).\frac{G1.G2 + G2 + 1}{1 + G2}$$

Ejemplo

- **Hallamos Y(s)**

$$Y(s) = Yp(s) + Yx(s)$$

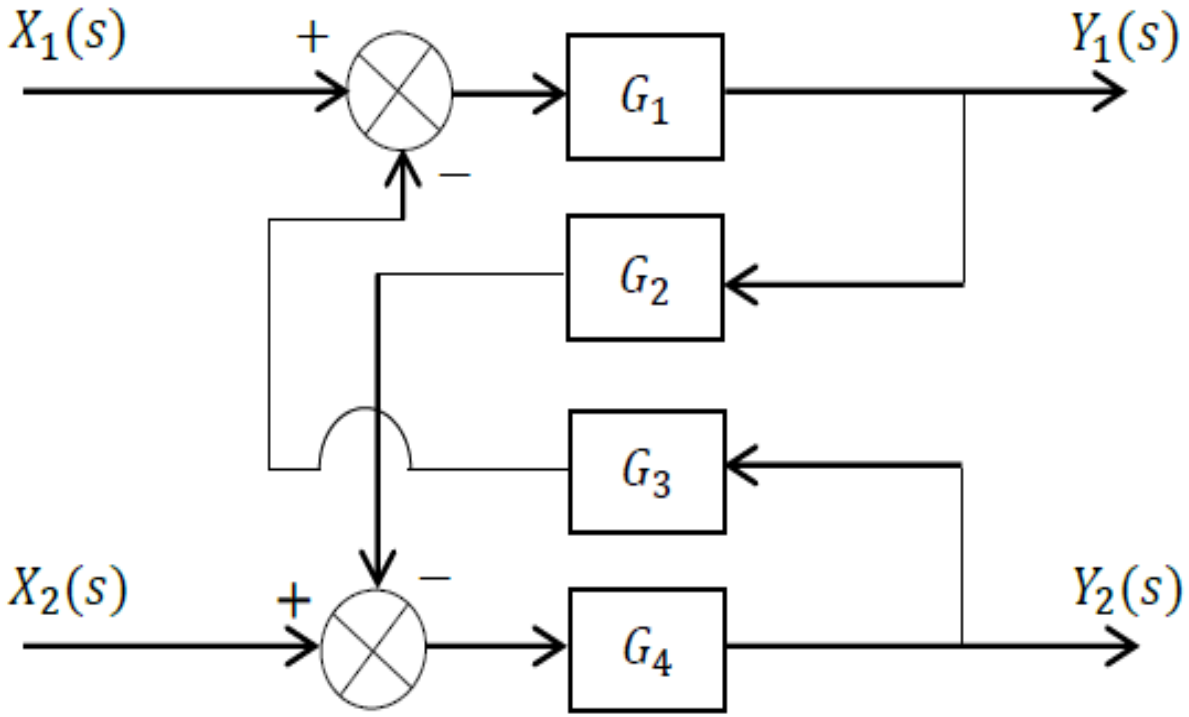
$$Yp(s) = P(s)\frac{G2}{1 + G2}$$

$$Yx(s) = X(s).\frac{G1.G2 + G2 + 1}{1 + G2}$$

$$Yx(s) = P(s)\frac{G2}{1 + G2} + X(s).\frac{G1.G2 + G2 + 1}{1 + G2}$$

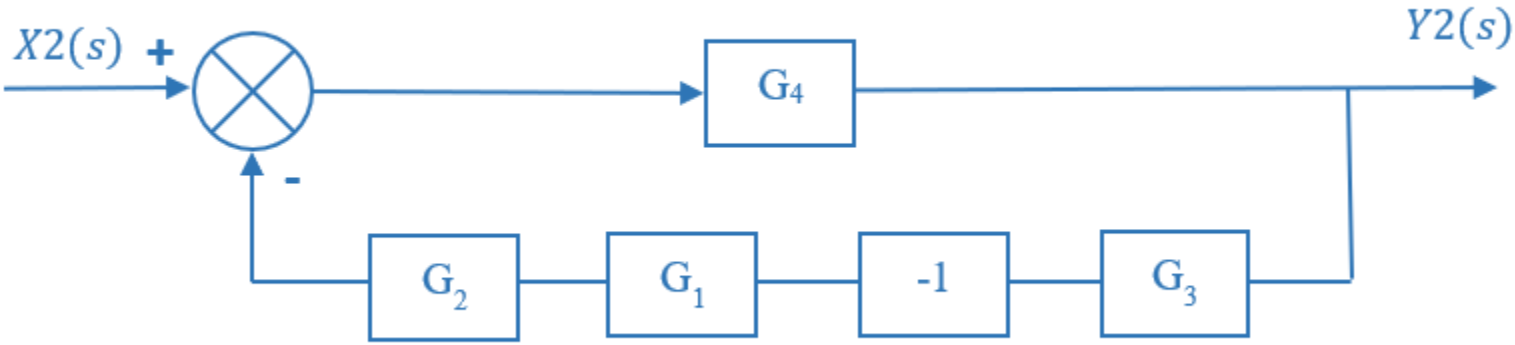
Ejemplo

- **Hallar Y2(s)**



Ejemplo

- **Hacemos X1(s)=0**

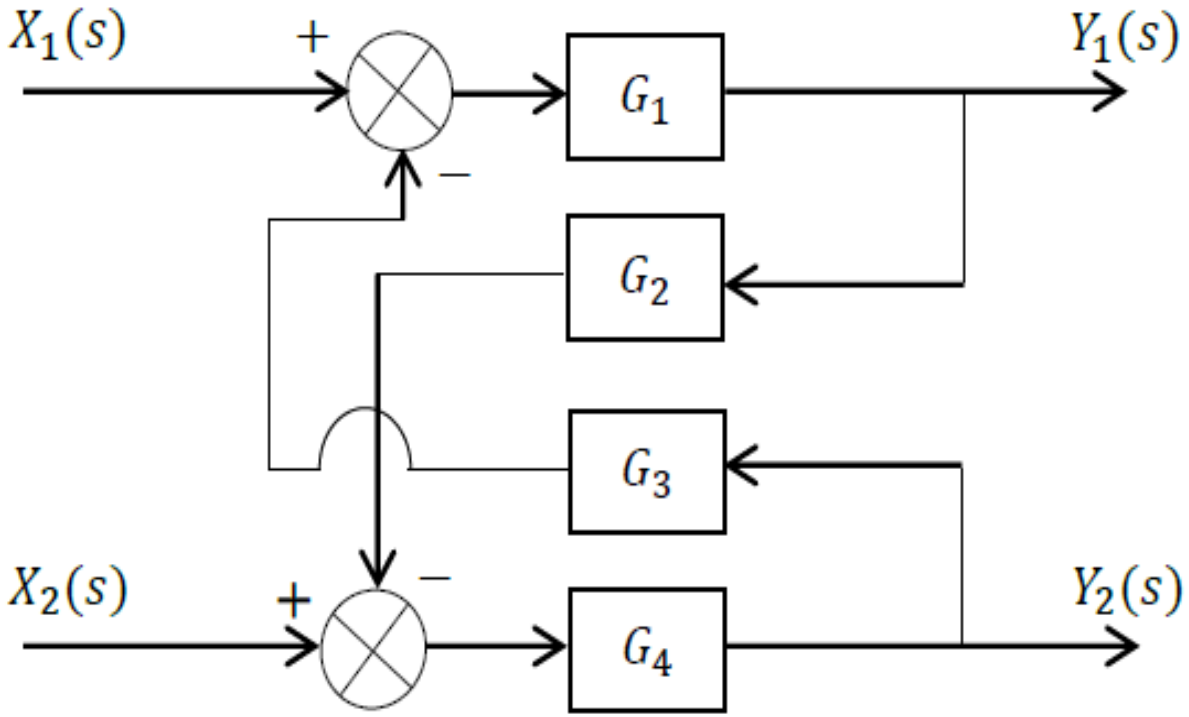


$$Y_{2X2}(s) = X2(s).\frac{G4}{1 + G4.G3.(-1).G1.G2}$$

$$Y_{2X2}(s) = X2(s).\frac{G4}{1 - G1.G2.G3.G4}$$

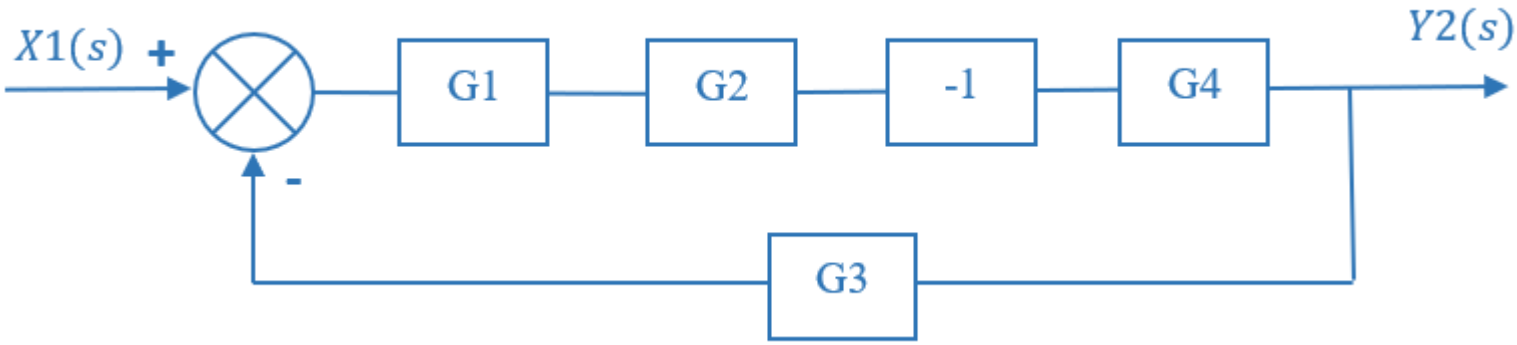
Ejemplo

- **Hacemos X2(s)=0**



Ejemplo

- **Hacemos X2(s)=0**



$$Y_{2x1}(s) = X1(s).\frac{G1.G2.(-1).G4}{1 + G1.G2.(-1).G4.G3}$$

$$Y_{2x1}(s) = -X1(s).\frac{G1.G2.G4}{1 - G1.G2.G3.G4}$$

Ejemplo

- **Hallamos Y2(s)**

$$Y2(s) = Y_{2X2}(s) + Y_{2X1}(s)$$

$$Y_{2x2}(s) = X2(s).\frac{G4}{1 - G1.G2.G3.G4}$$

$$Y_{2x1}(s) = -X1(s).\frac{G1.G2.G4}{1 - G1.G2.G3.G4}$$

$$Y2(s) = \frac{X2(s).G4 - X1(s).G1.G2.G4}{1 - G1.G2.G3.G4}$$