

## Aula 4

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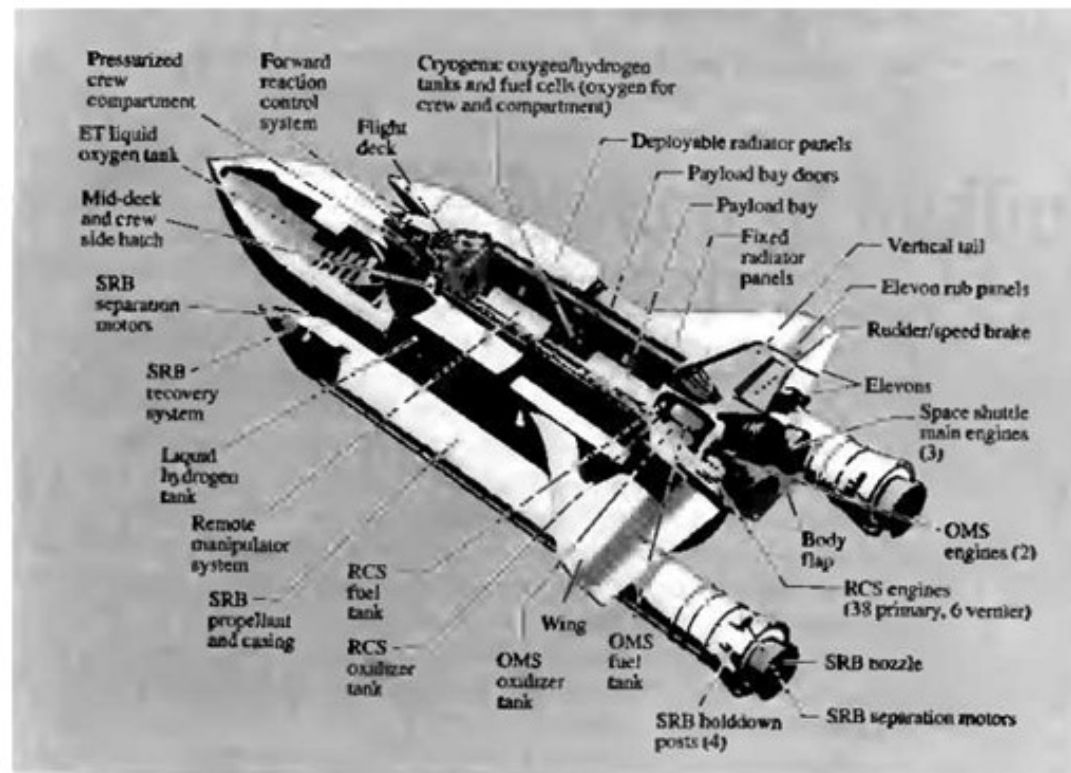
Curitiba, Março de 2012.

# Resumo

- 1 Diagramas de Blocos
- 2 Movendo Blocos
- 3 Simplificações
- 4 Exercícios

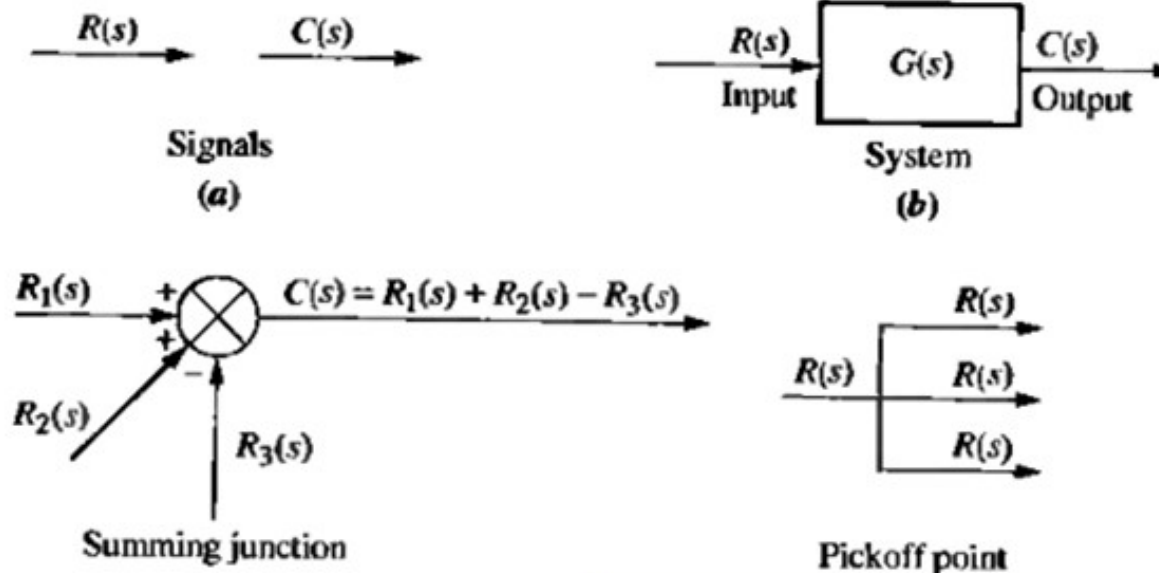
# Diagrama de Blocos

- Um subsistema pode ser representado por um bloco com uma entrada, uma saída e uma função de transferência.
- Muitos sistemas são compostos por vários subsistemas, tais como ilustrado abaixo.



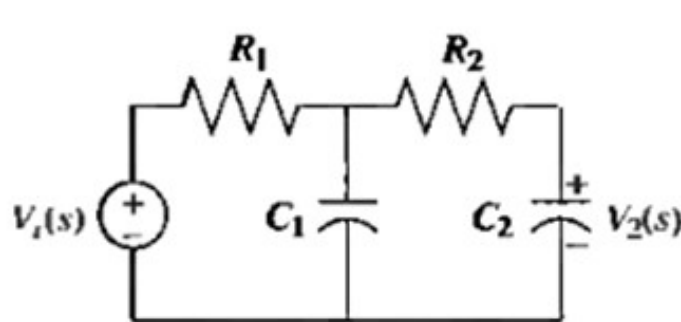
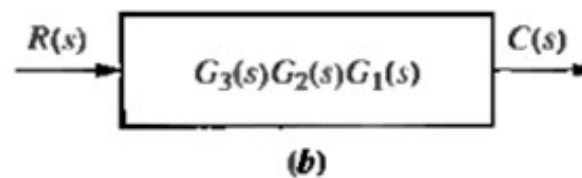
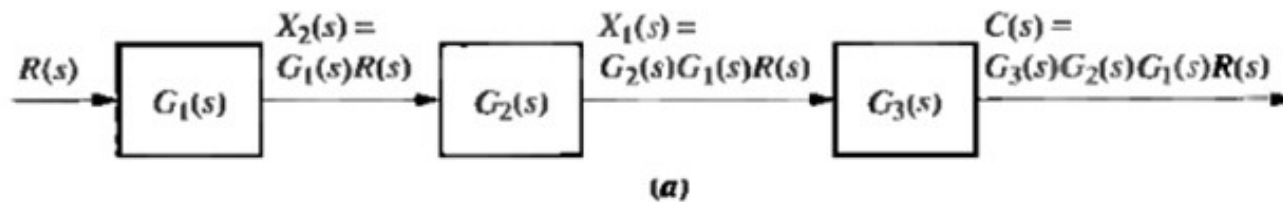
# Diagrama de Blocos

- Quando vários subsistemas são interconectados, necessitamos de mais elementos para o diagrama de Blocos, tais como junção de soma ou subtração, pontos de ramificação.
- Todos os componentes que formam um diagrama de blocos são ilustrados a seguir:



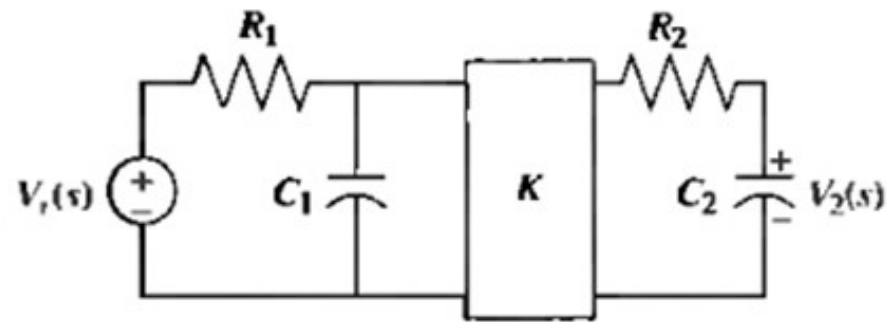
# Diagrama de Blocos

## FORMA CASCATA



$$G_T(s) = \frac{V_2(s)}{V_i(s)} \neq G_2(s)G_1(s)$$

(c)

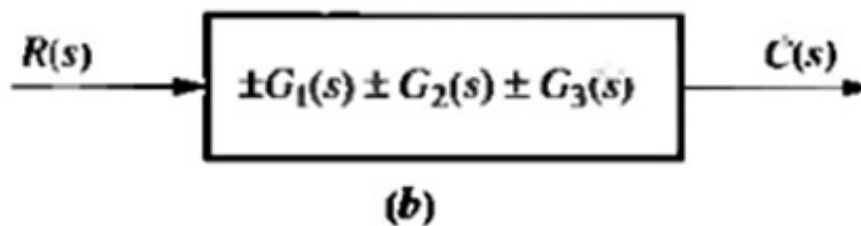
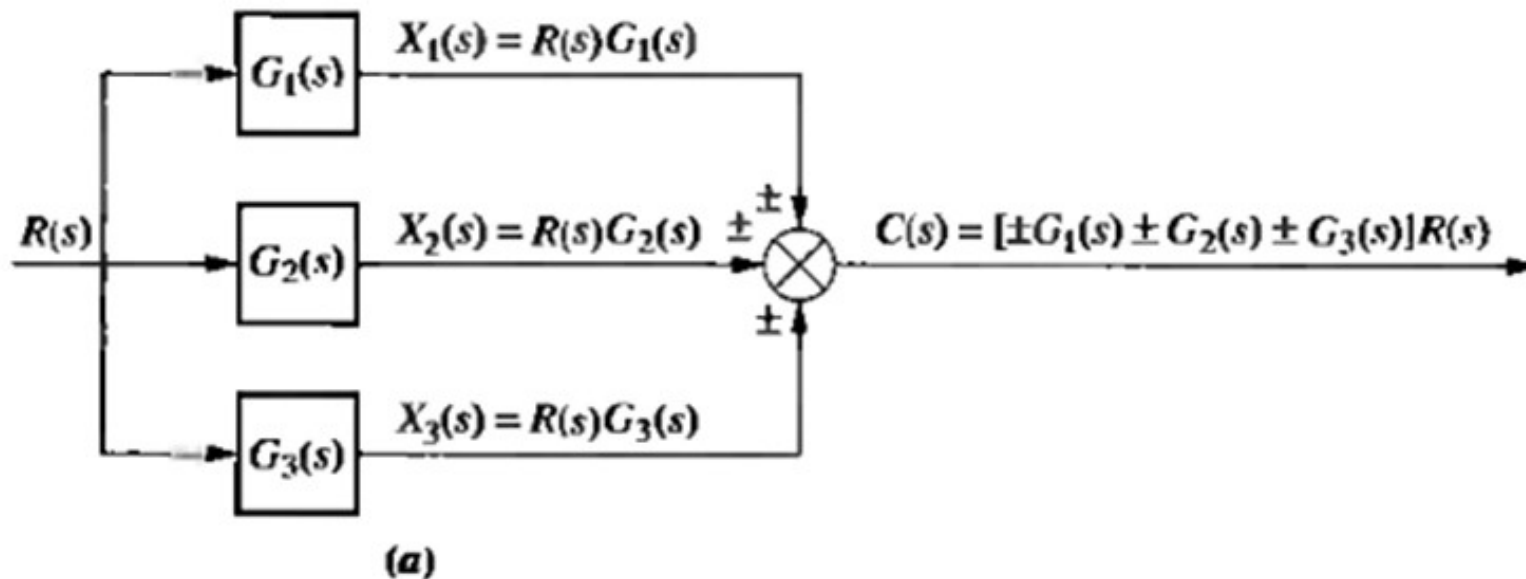


$$G_T(s) = \frac{V_2(s)}{V_i(s)} = KG_2(s)G_1(s)$$

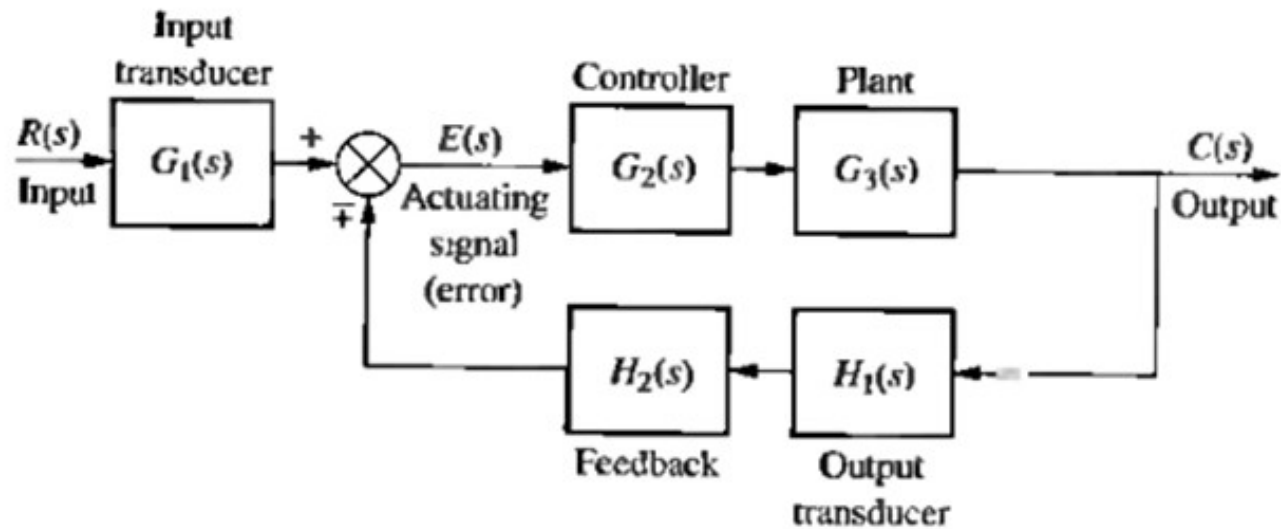
(d)

# Diagrama de Blocos

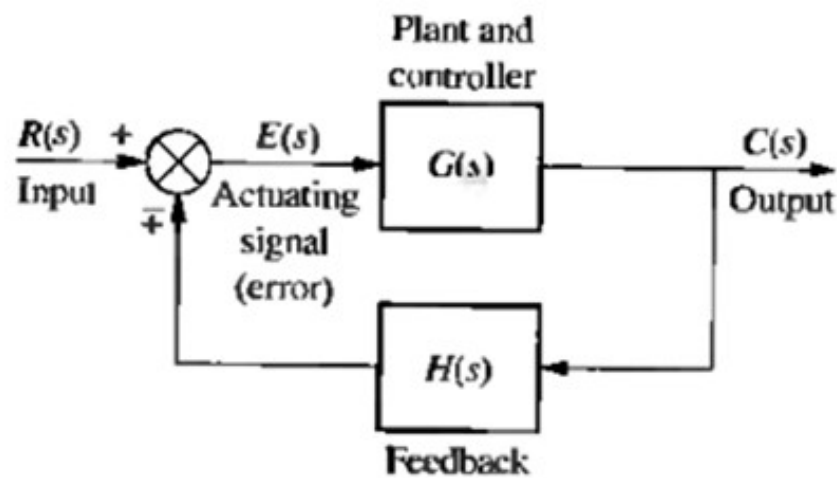
## FORMA PARALELA



## FORMA EM REALIMENTAÇÃO

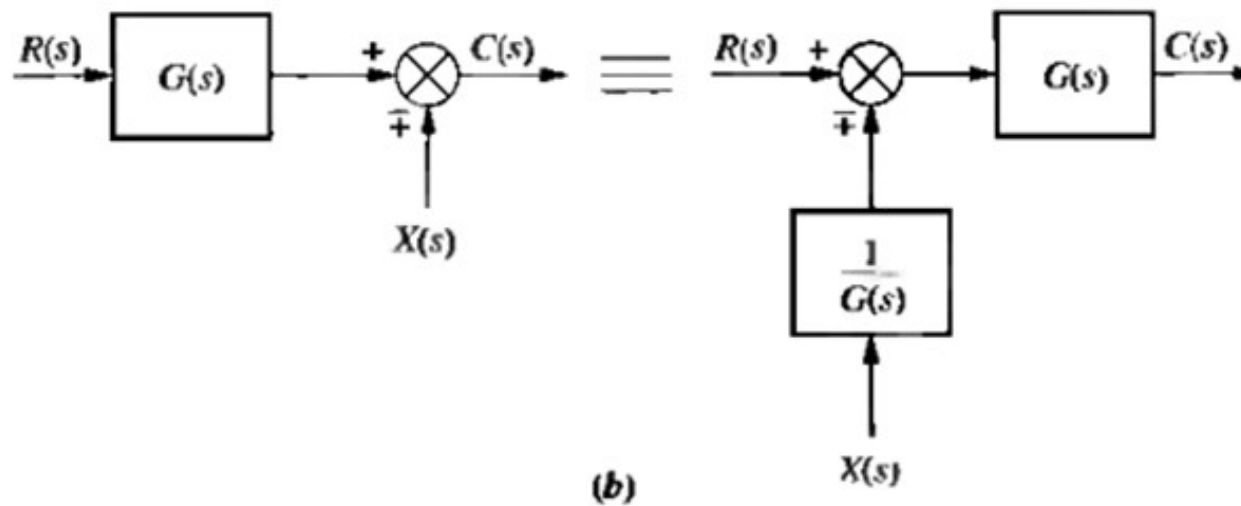
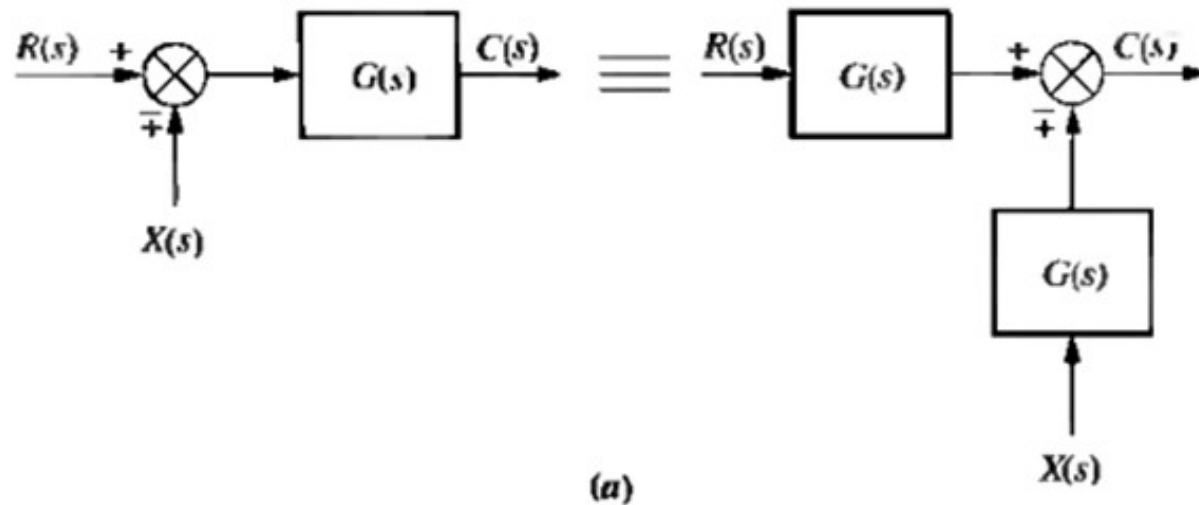


(a)



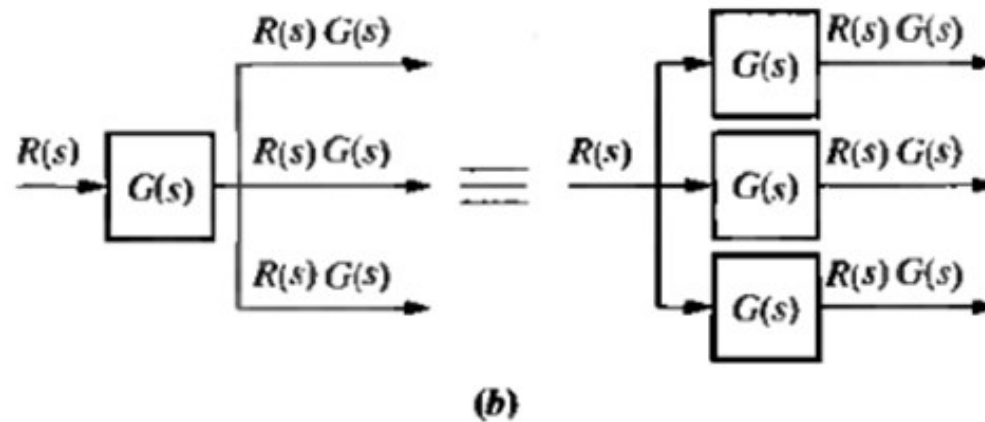
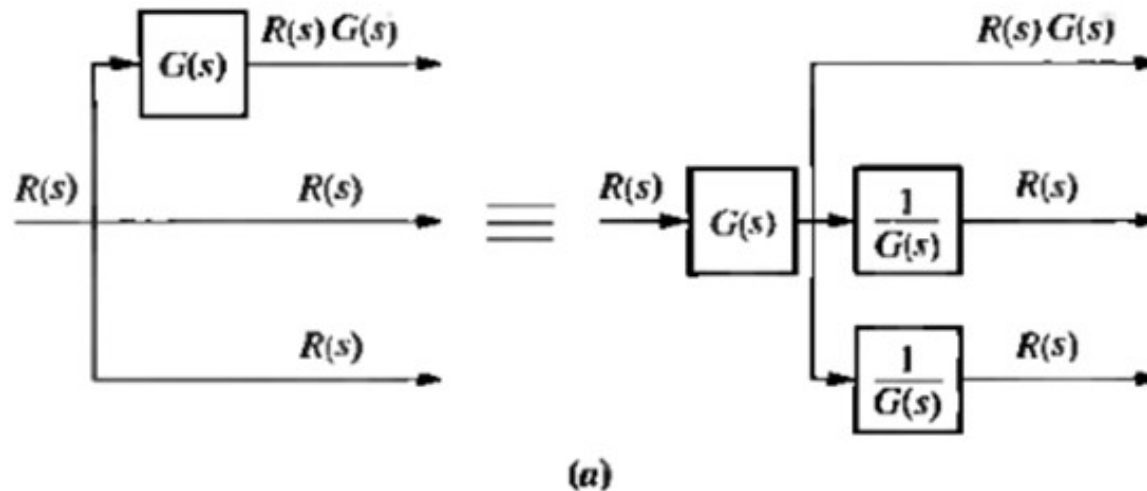
(b)

# Movendo Blocos



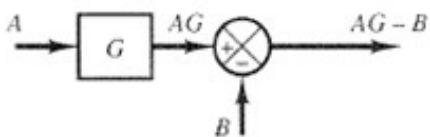
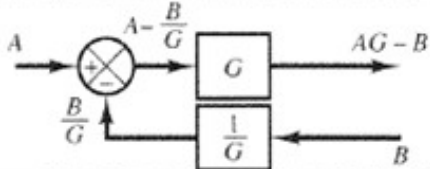
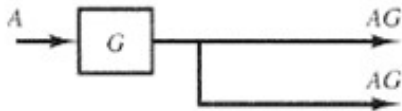
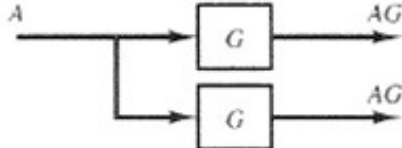
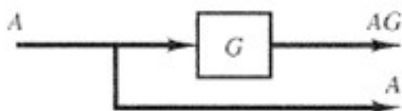
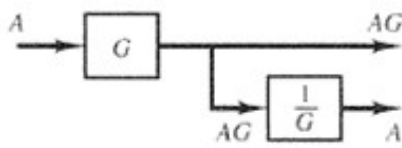
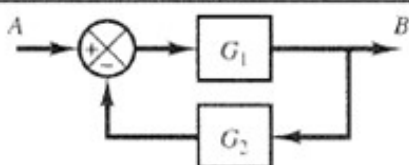
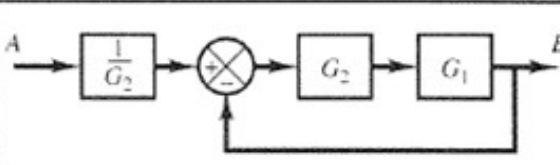
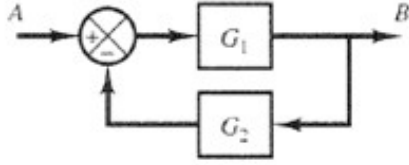
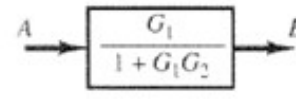


# Movendo Blocos

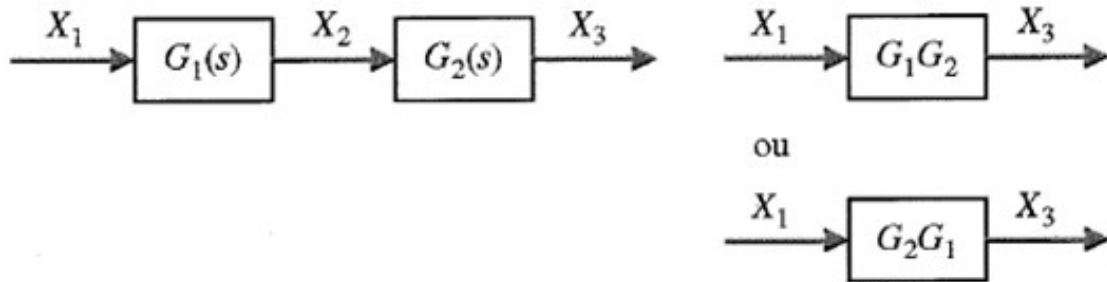


# Simplificações

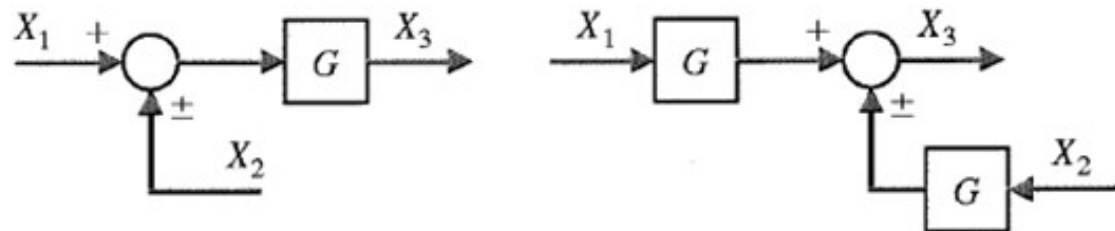
**Tabela 3-1** Regras da álgebra de blocos

	Diagramas de Blocos Originais	Diagramas de Blocos Equivalentes
1		
2		
3		
4		
5		

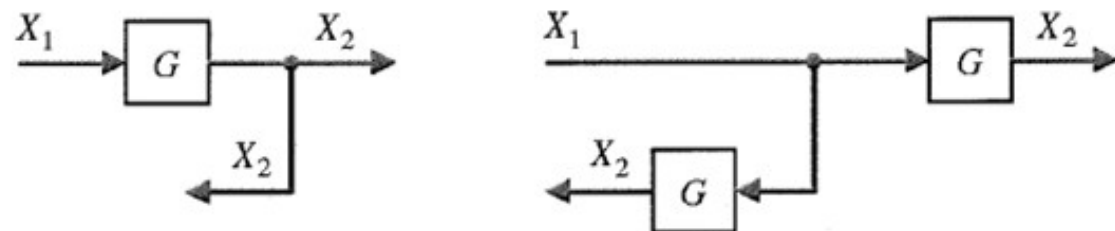
1. Combinando blocos em cascata

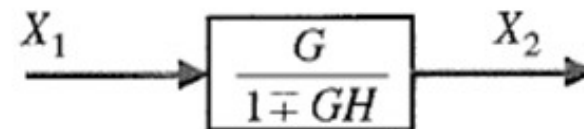
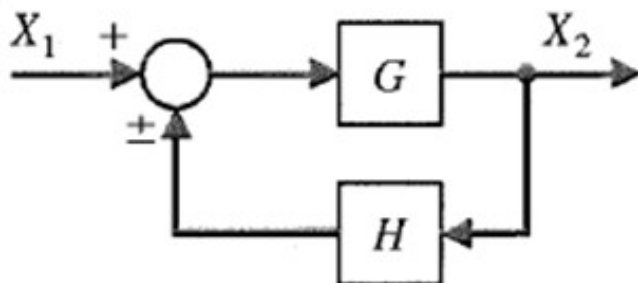
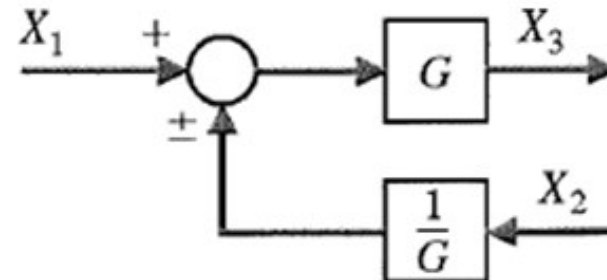
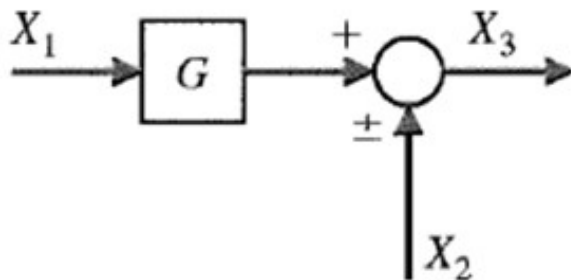
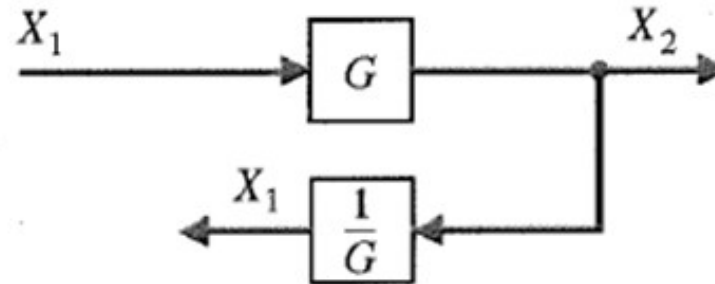
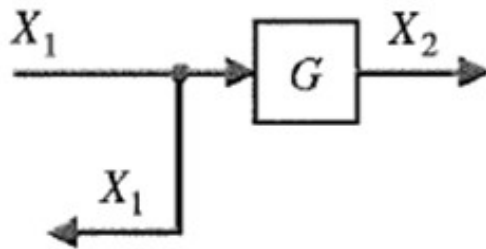


2. Deslocando para a frente um ponto de soma situado atrás de um bloco



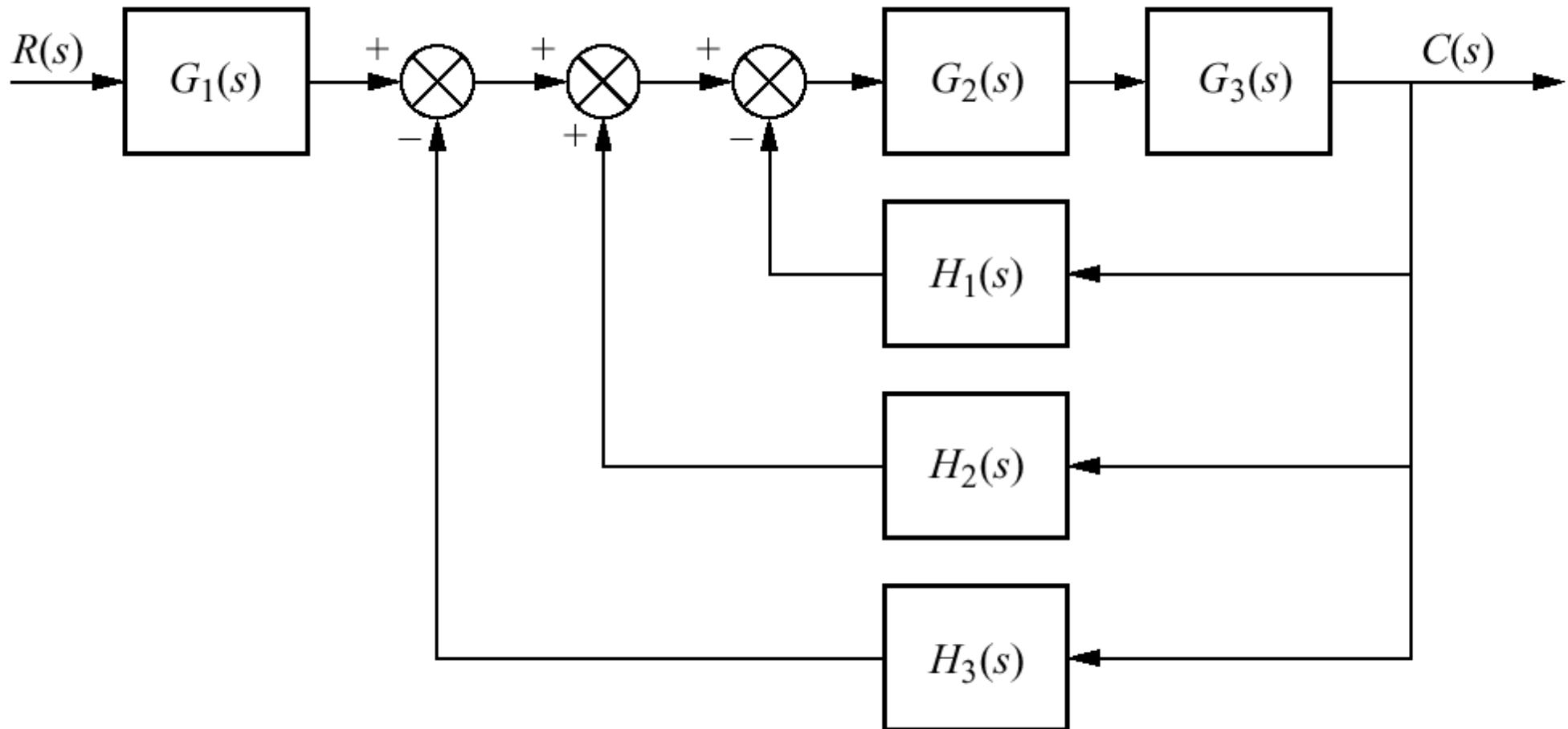
3. Deslocando para trás um ponto de derivação situado à frente de um bloco





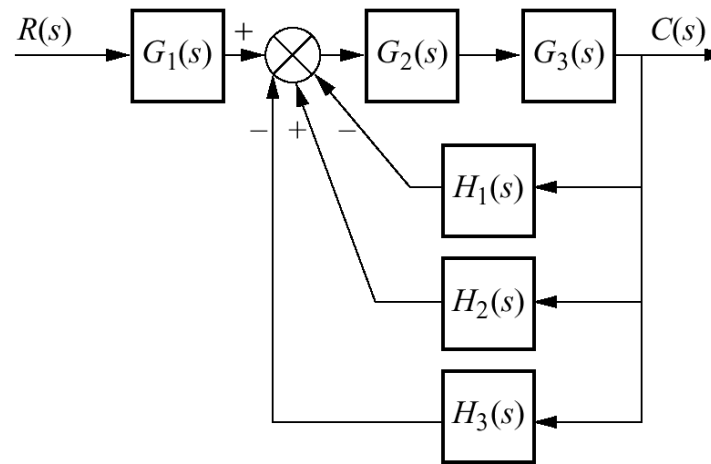
## Exercício 1

Simplifique o seguinte diagrama de blocos.

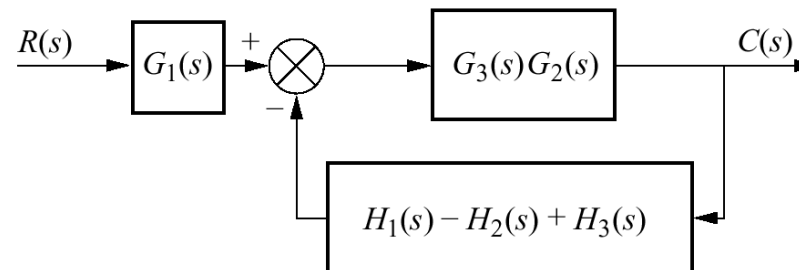


# Exercício 1

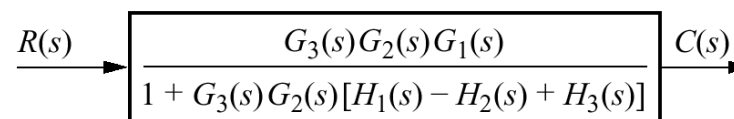
Resposta:



(a)



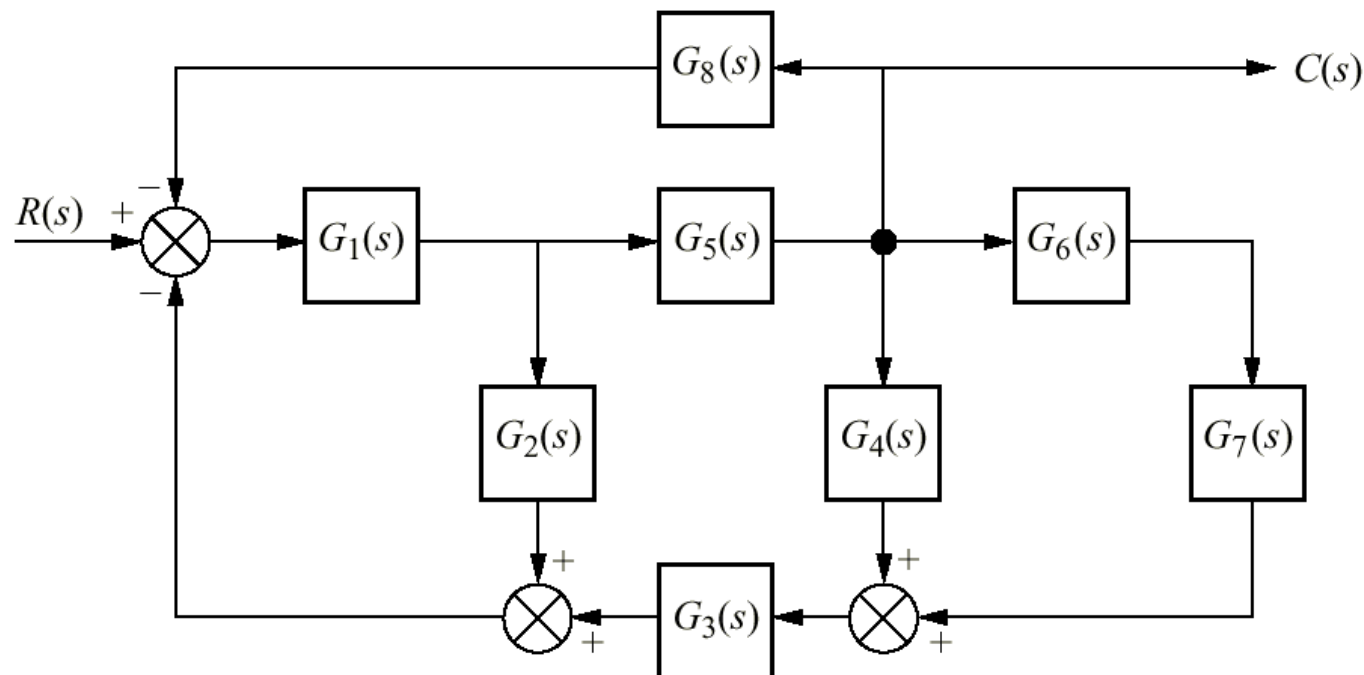
(b)



(c)

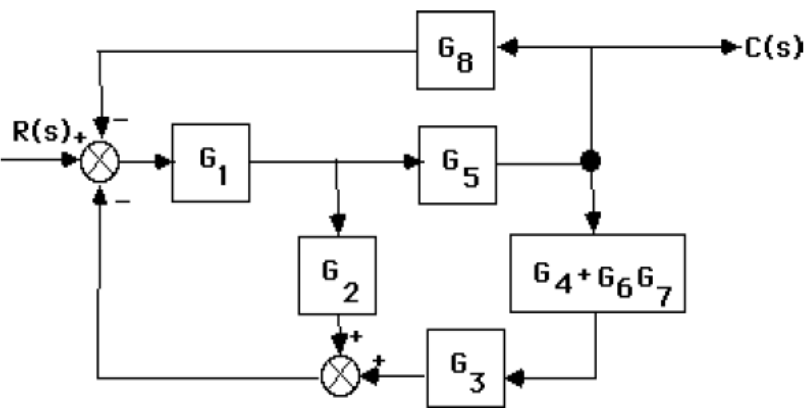
## Exercício 2

Encontre a função de transferência  $C(s)/R(s)$  do seguinte circuito.

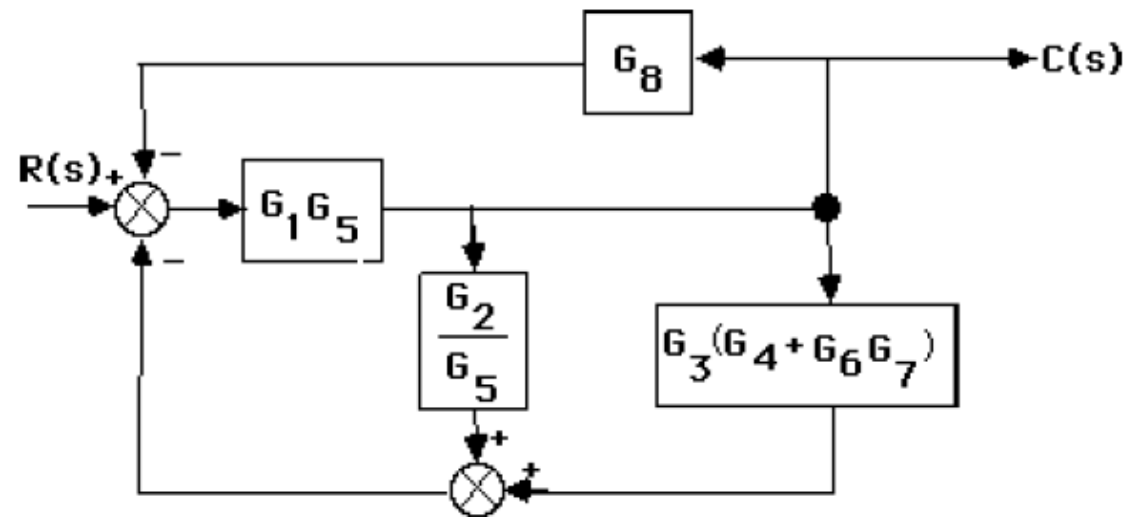
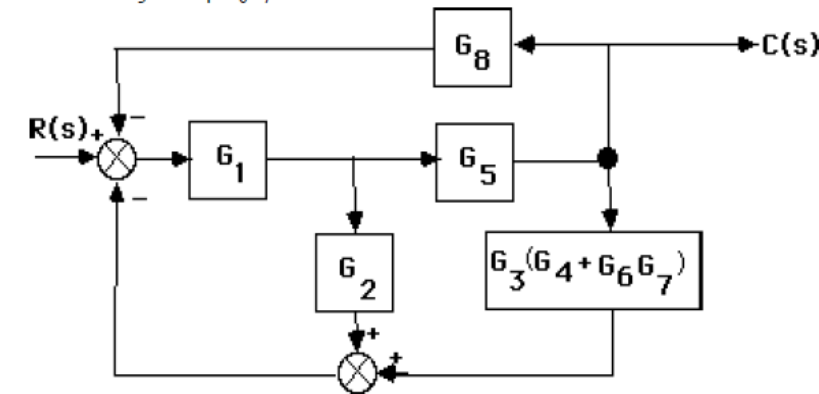


## Exercício 2

Resposta:



Next combine  $G_3$  and  $G_4 + G_6G_7$ .



$$T(s) = \frac{G_5 G_1}{1 + G_1 (G_8 G_5 + G_7 G_6 G_5 G_3 + G_5 G_4 G_3 + G_2)}$$