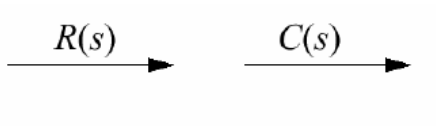
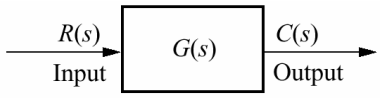
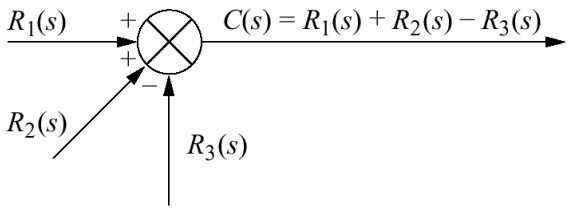
Blok Diyagramlar



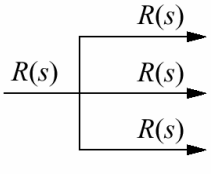
Sinyaller



G(s) transfer fonksiyonuna ait bir giriş bir çıkışı olan sistemin blok gösterimi

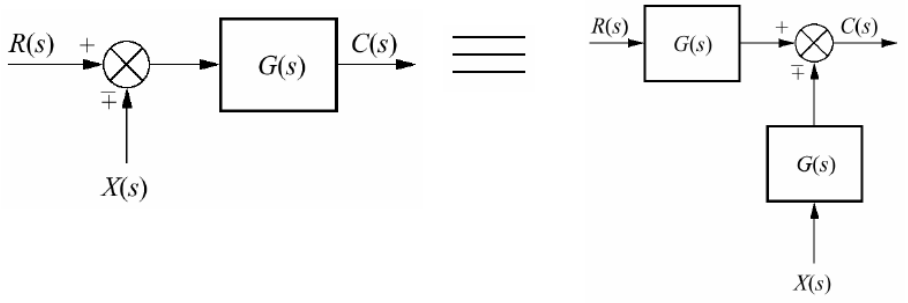


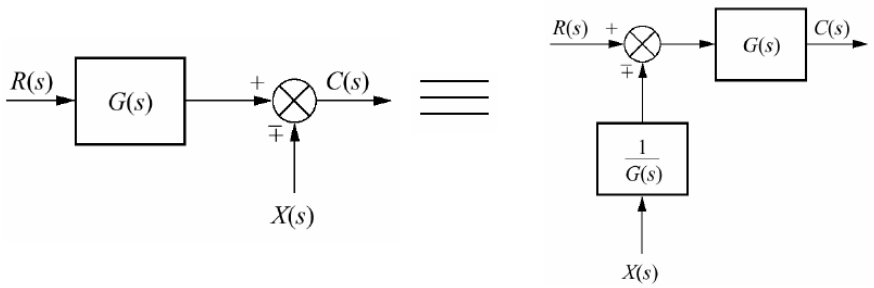
Toplama işlemi gösterimi

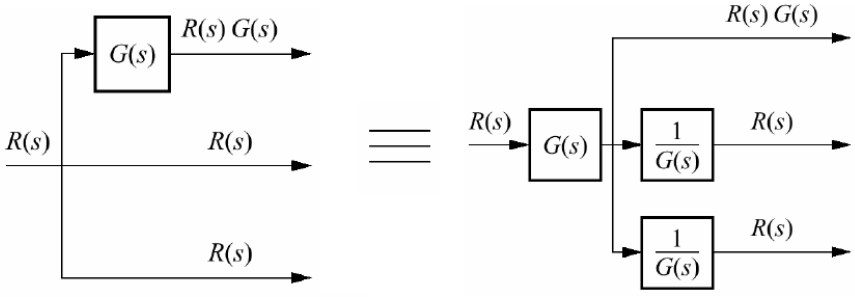


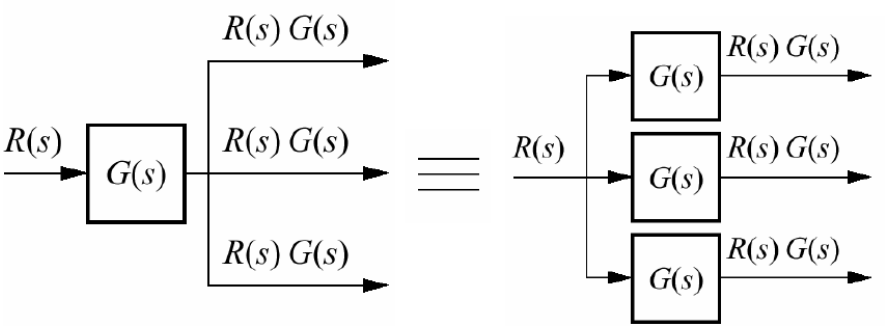
Sinyali birden fazla kullanma

Denk Gösterimler





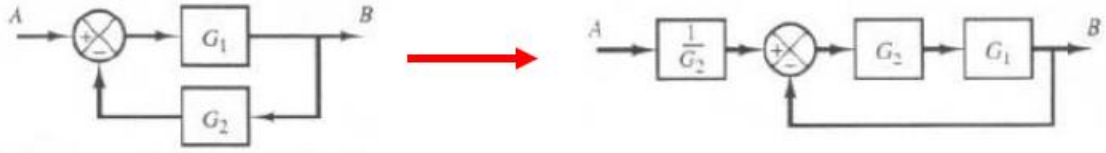


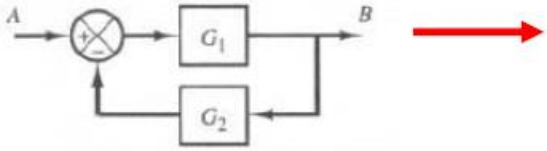

R(s)
G(s)
R(s) G(s)
R(s) G(s)
R(s) G(s)
≡
R(s)
G(s)
G(s)
G(s)
R(s) G(s)
R(s) G(s)
R(s) G(s)


A
G
AG
AG − B
B
A
A − B/G
G
AG − B
B/G
1/G
B

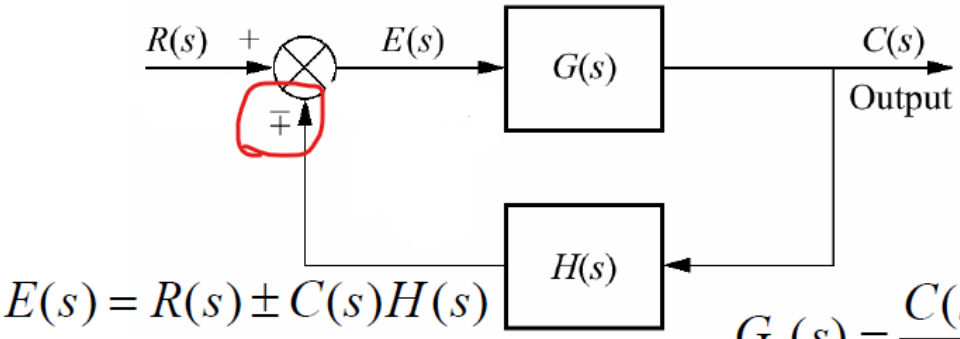

A
G
AG
AG
A
G
AG
G
AG


A
G
AG
A
A
G
AG
AG
1/G
A


A
G1
B
G2
A
1/G2
G2
G1
B


A
G1
B
G2
A
G1/(1 + G1G2)
B

Genel geri beslemeli sistem gösterimi



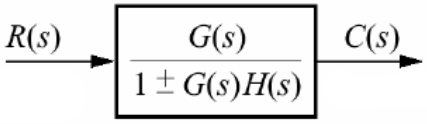
$$E(s) = R(s) \pm C(s)H(s)$$

$$C(s) = E(s)G(s)$$

$$E(s) = \frac{C(s)}{G(s)}$$

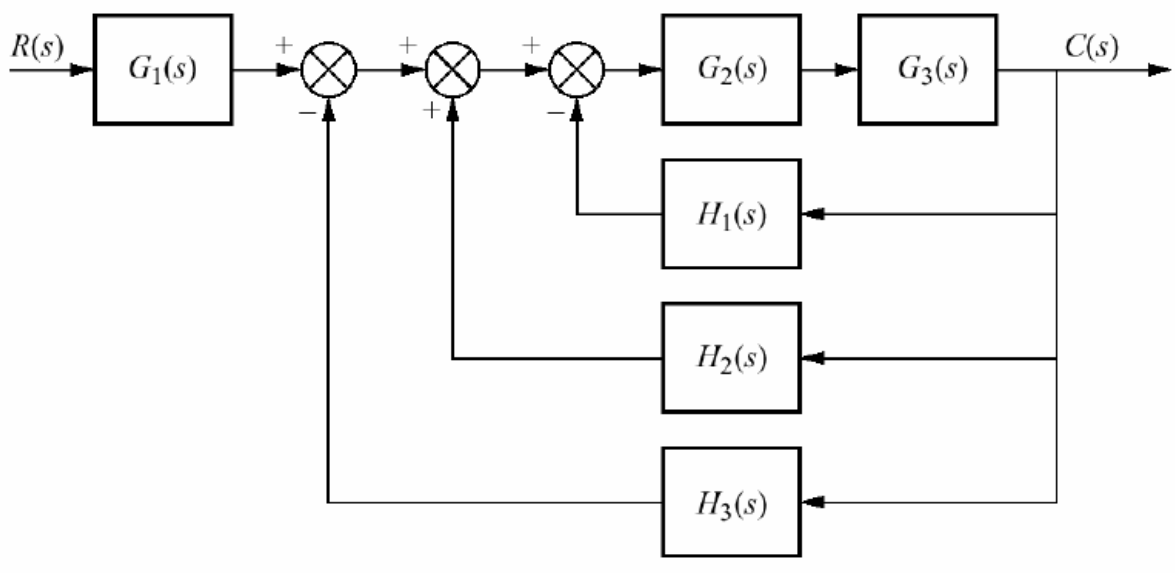
$$G_e(s) = \frac{C(s)}{R(s)}$$

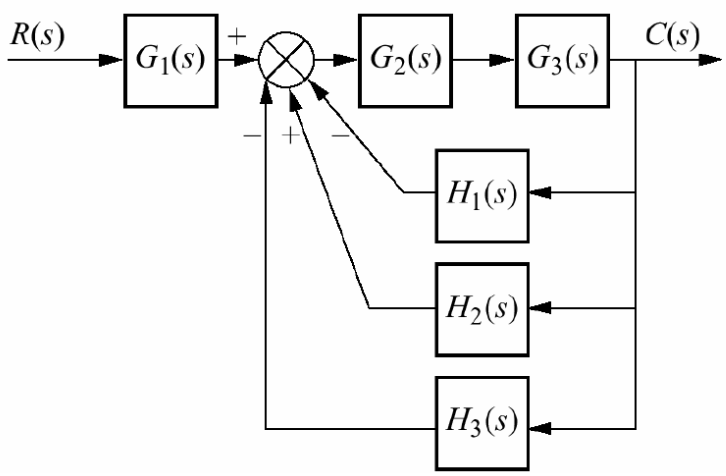
$$G_e(s) = \frac{G(s)}{1 \pm G(s)H(s)}$$

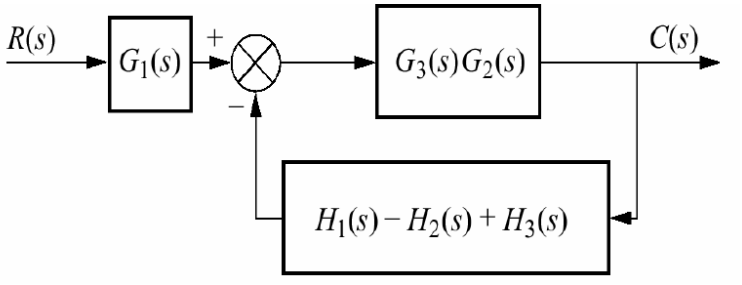


Not: işaretin değiştiğine dikkat edin!

Örnek 1:

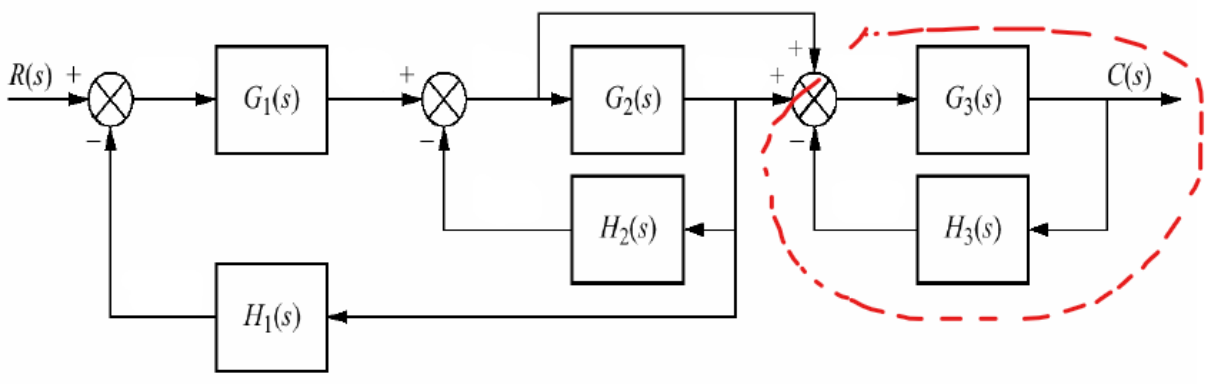




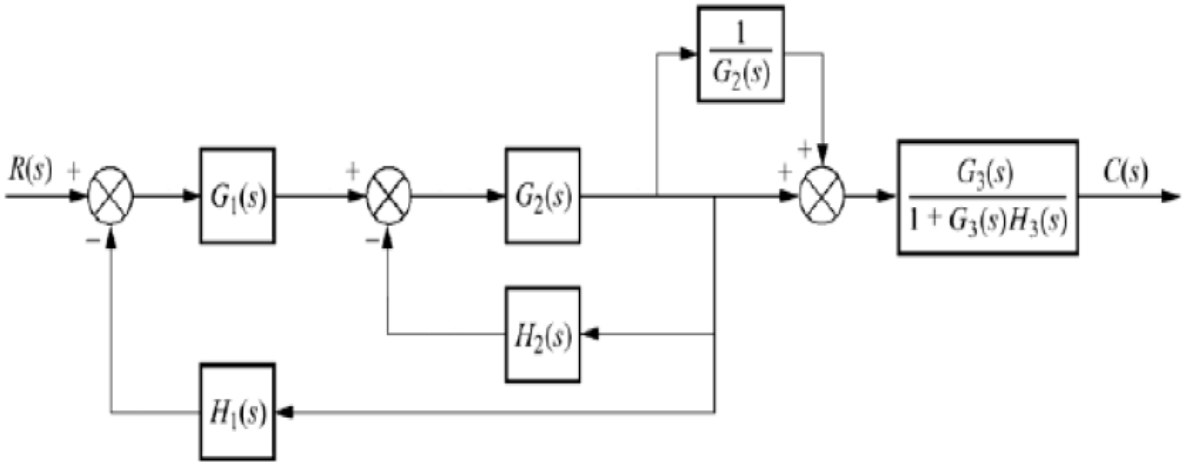


$$R(s) \rightarrow \frac{G_3(s)G_2(s)G_1(s)}{1 + G_3(s)G_2(s)[H_1(s) - H_2(s) + H_3(s)]} \rightarrow C(s)$$

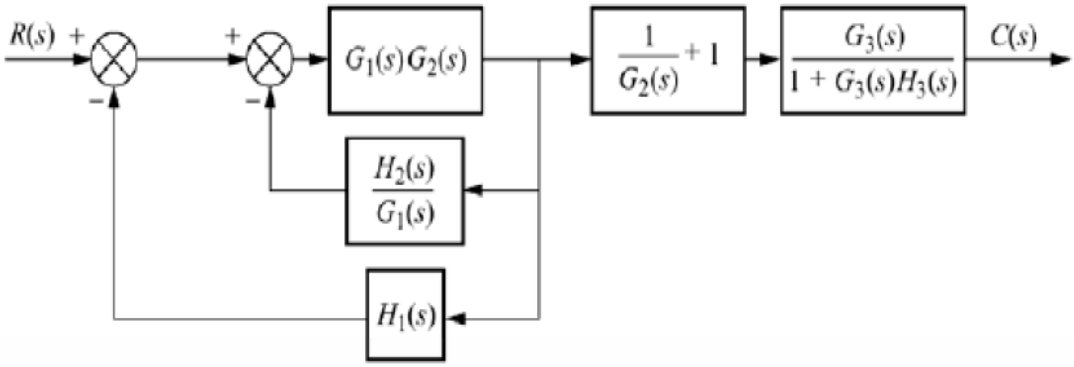
Örnek 2:



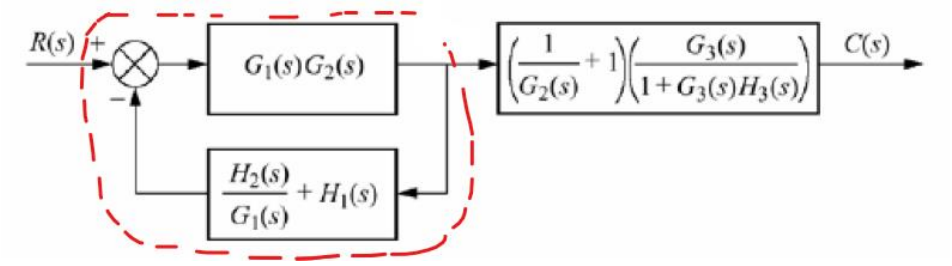
Adım 1: olarak kırmızı ile işaretli kısmı tipik bir geri besleme olarak düşünüp doğrudan yazabiliriz. G_2 üzerindeki boş hattı da G_2 ye gölüp sağına alabiliriz.



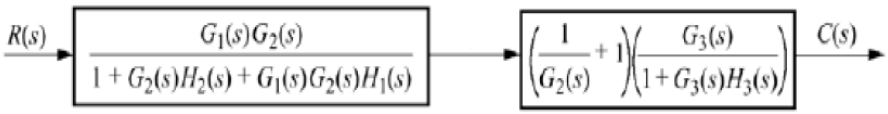
Adım 2: $1/G_2$ ifadesini toplama işaretini kaldırarak sağa ekleyebiliriz. Ders notunun üst kısmındaki denklik ifadelerine bakarak H_2 ifadesini o denk ifadelerine bakarak G_1 ifadesinin soluna aktarabiliriz.

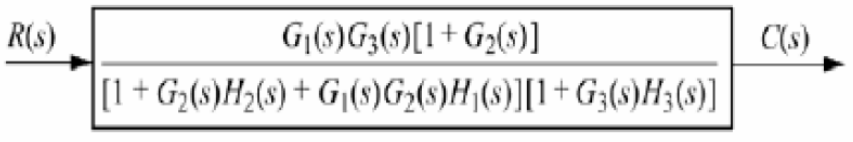


Adım 3: Bir önceki örnekteki gibi H_2/G_1ile H_1 ifadesini birleştirebiliriz.

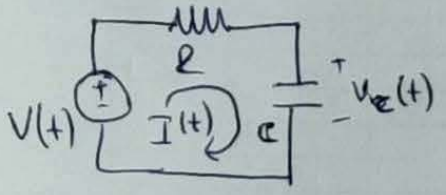


Adım 4: Kırmızı ile işaretli kısım geri beslemeli bir ifade yukarıdaki örneğe bakarak sadeleştirebiliriz.





Örnek 3: RC Devre örneği



$I(t) = C \cdot \frac{dV_c}{dt}$

$V(t) = V_R(t) + V_c(t)$

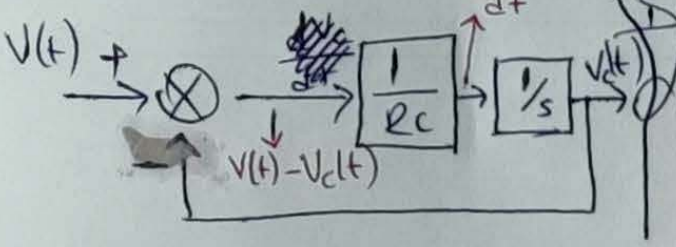
$= I(t) \cdot R + V_c(t)$

$V(t) = RC \cdot \frac{dV_c}{dt} + V_c(t)$

diferansiyel ifadesini yalnız bırakalım.

$\frac{dV_c}{dt} = \frac{V(t) - V_c(t)}{RC}$

Düzenlenirse dif ifadesi R farklı sinyalinde toplanması ile oluşturulmuş bir + diğeri − işaretli. Sistemin girişi V(t) olduğundan V(t) sinyalini giriş olarak veriyoruz.



yandaki sistemde çıkmış. Sinyalleri ifade etmektedir.