

Başkent Üniversitesi
Elektrik-Elektronik Müh. Bölümü
EEM 202 Devre Teorisi 2

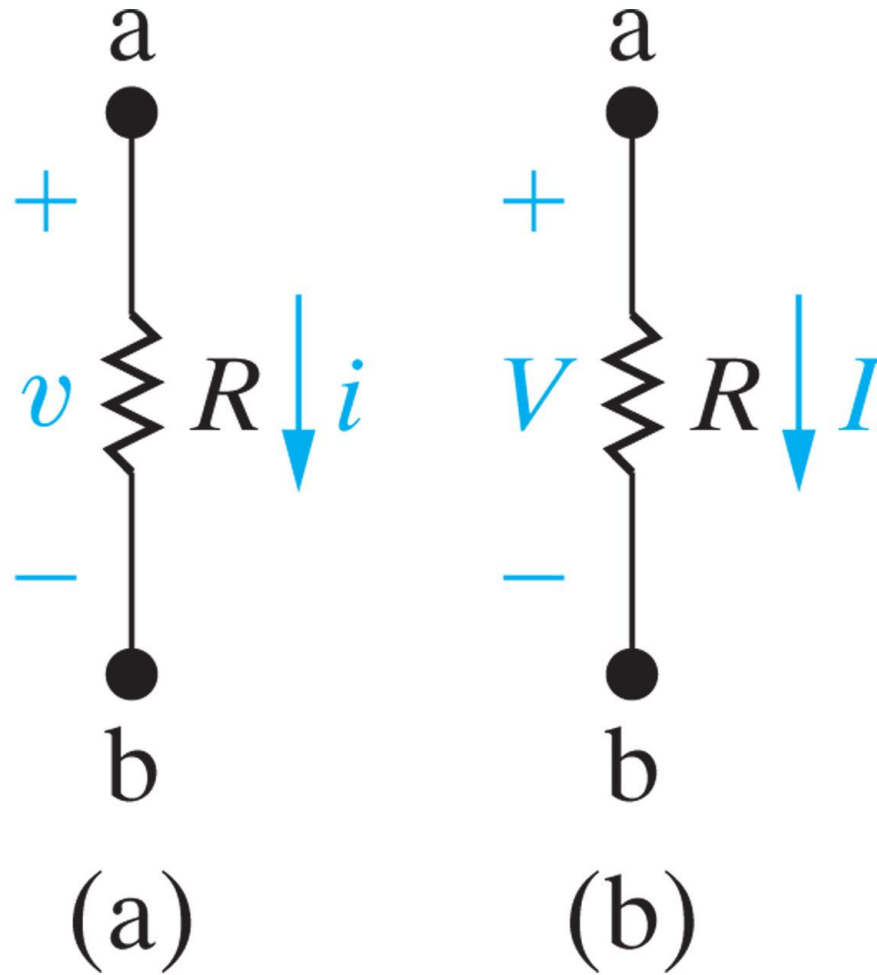
Devre Analizinde Laplace Dönüşümü

Yrd. Doç. Dr. Selda GÜNEY

İçerik

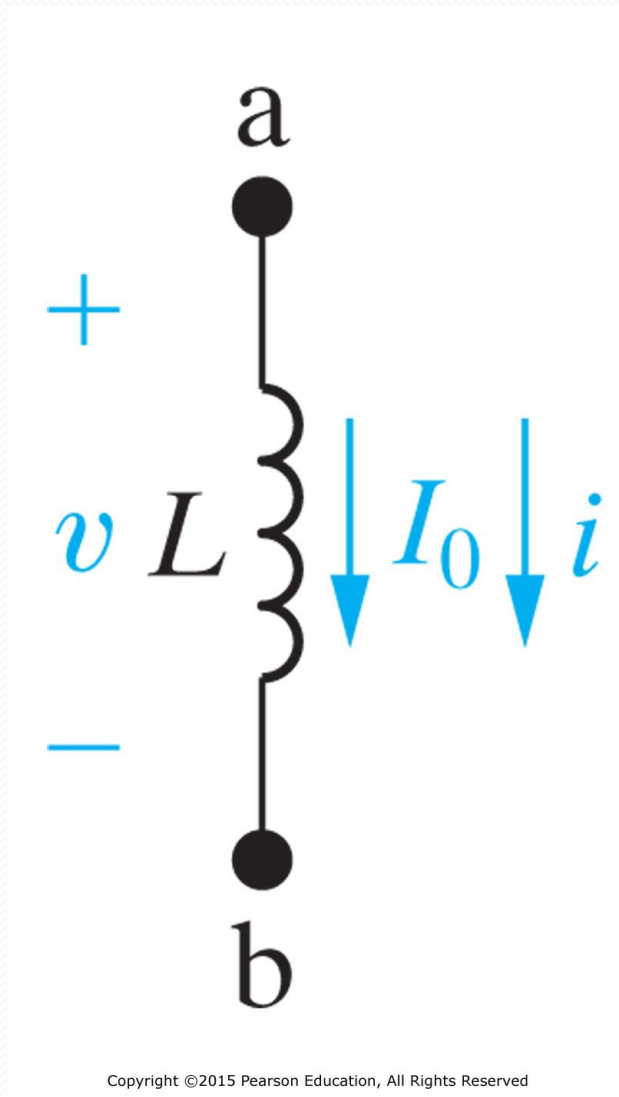
- s Bölgesinde Devre Elemanları
- s Bölgesinde Devre Analizi ve Uygulamalar
- Aktarım(Transfer) Fonksiyonu
- Kısmi Kesirlere Açılım ve Aktarım Fonksiyonu

s Bölgesinde Direnç Elemanı

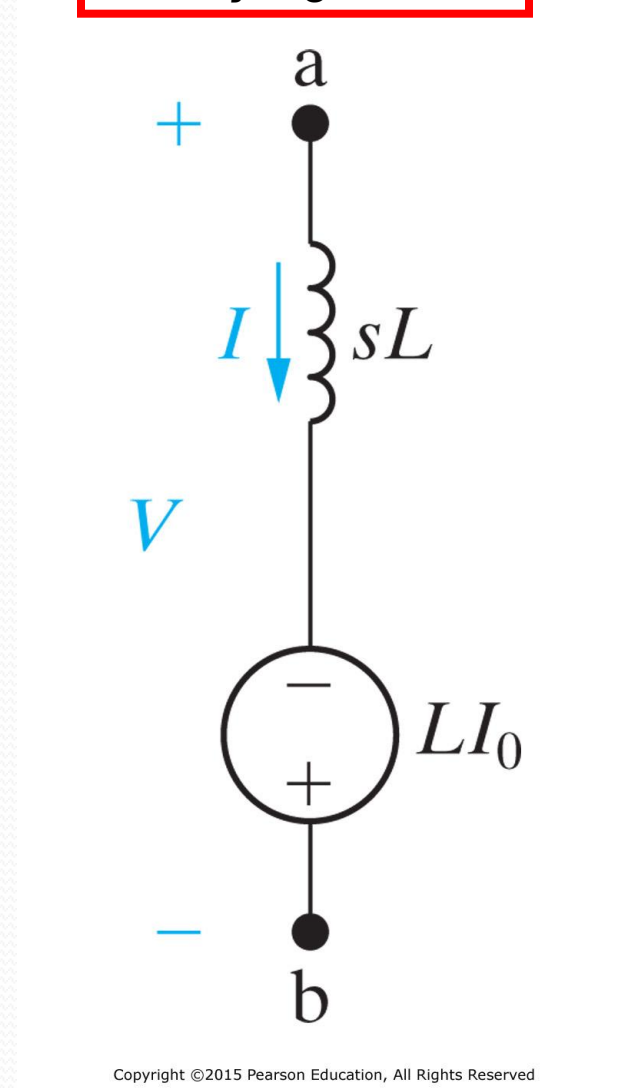


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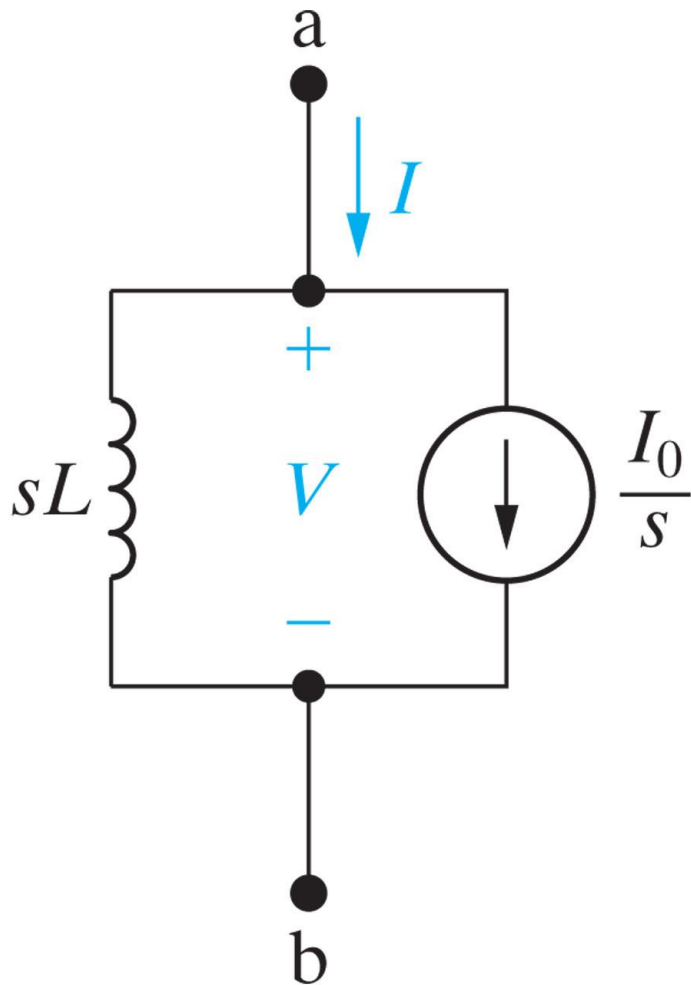


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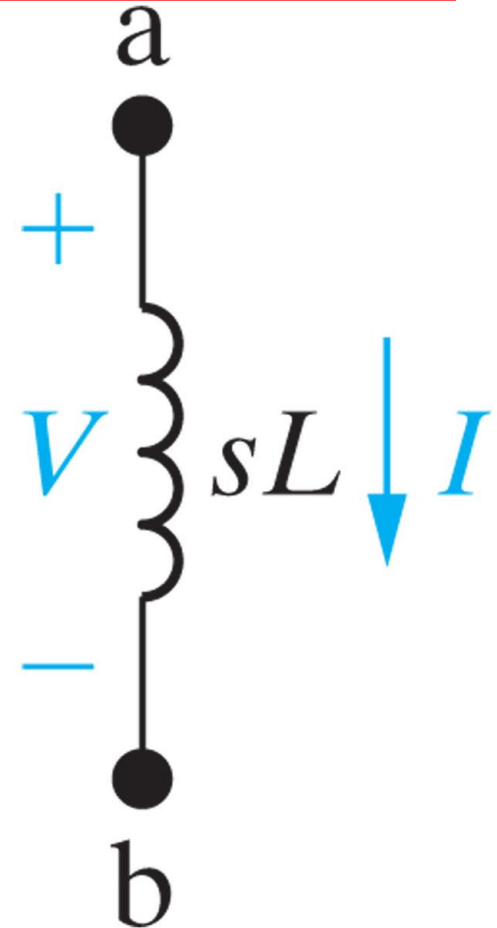
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Paralel eşdeğer Devre



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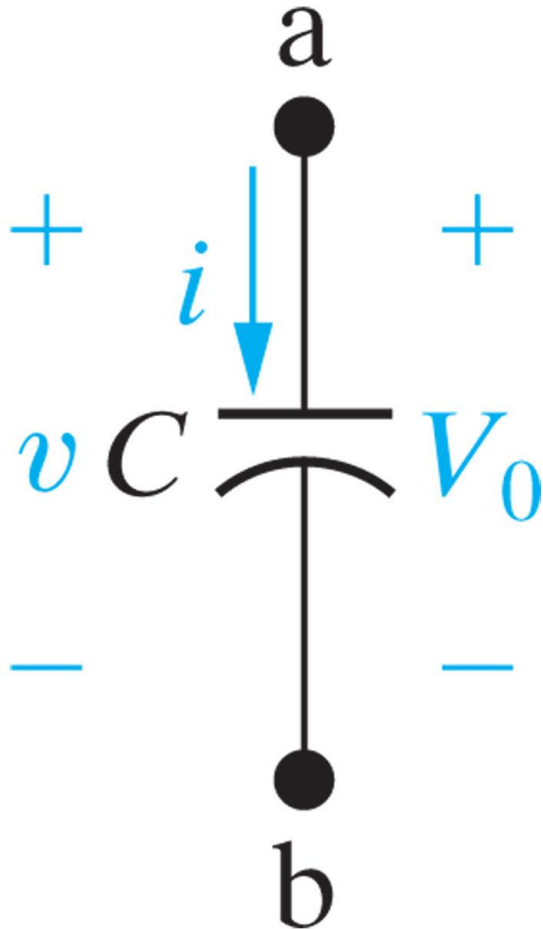
Depolanmış başlangıç enerjisi sıfırsa



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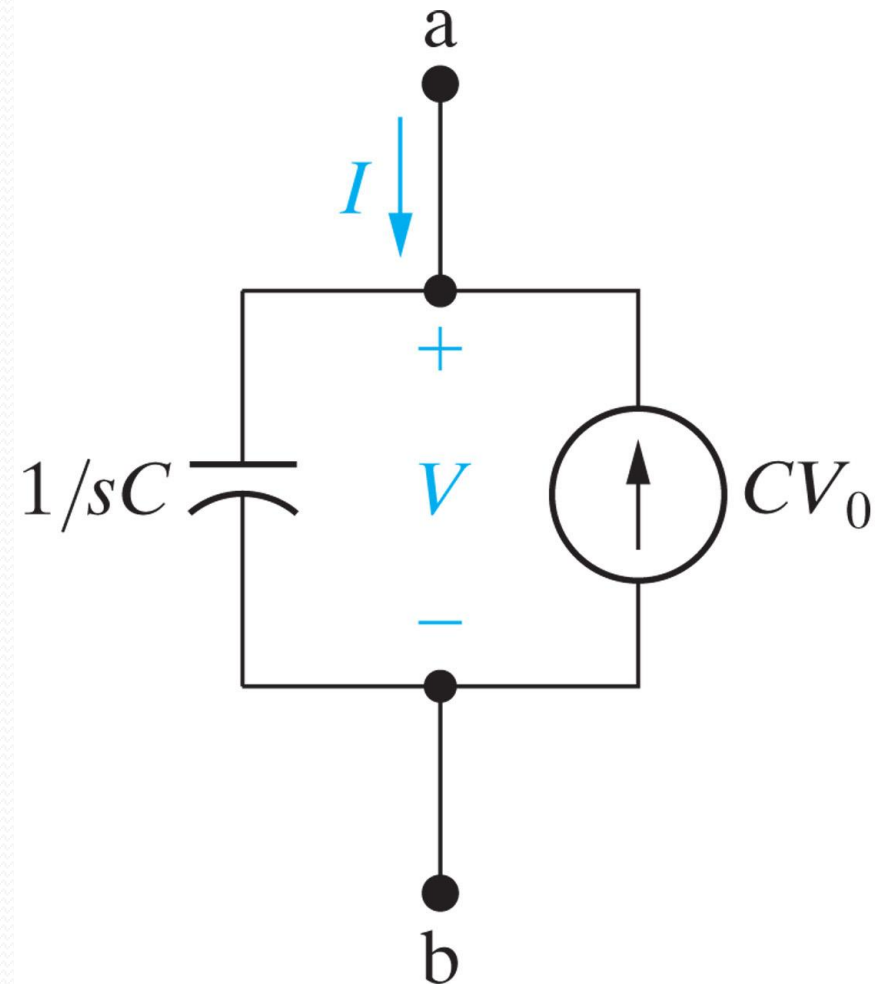
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Zaman bölgesinde



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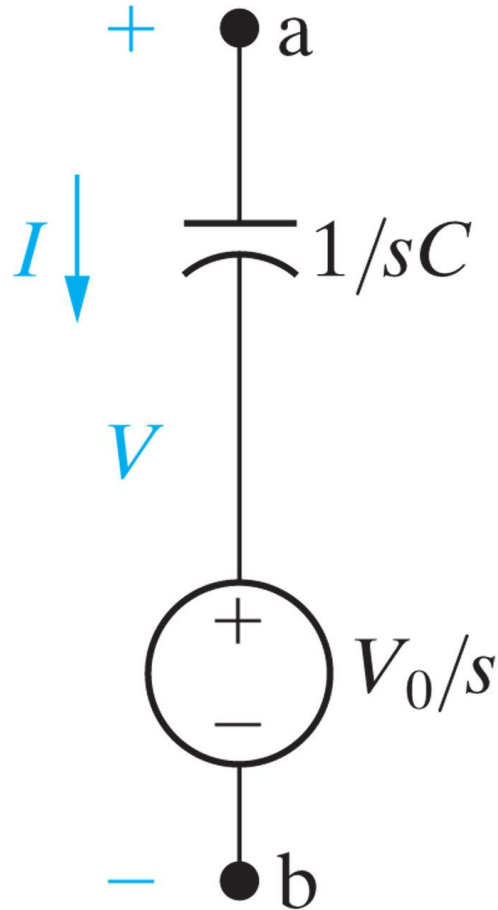
Paralel eşdeğer Devre



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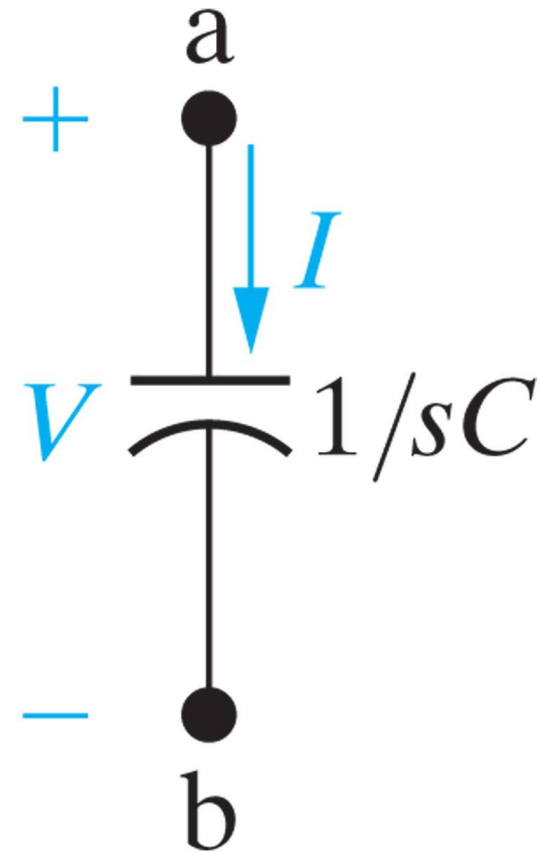
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Seri eşdeğer devre



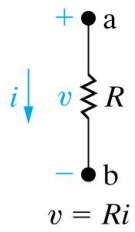
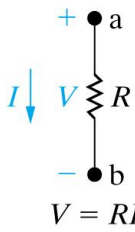
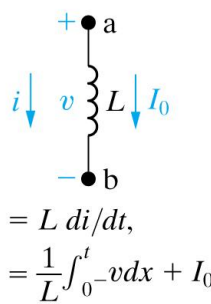
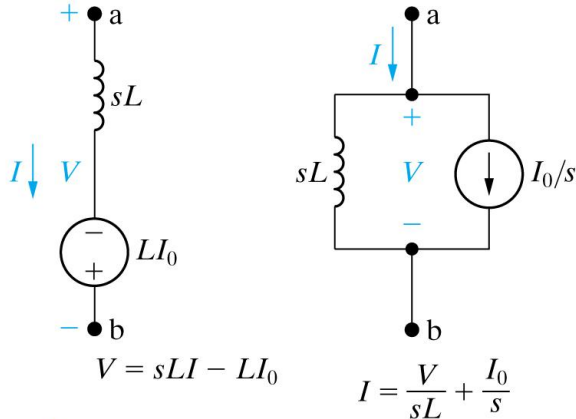
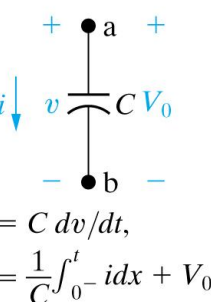
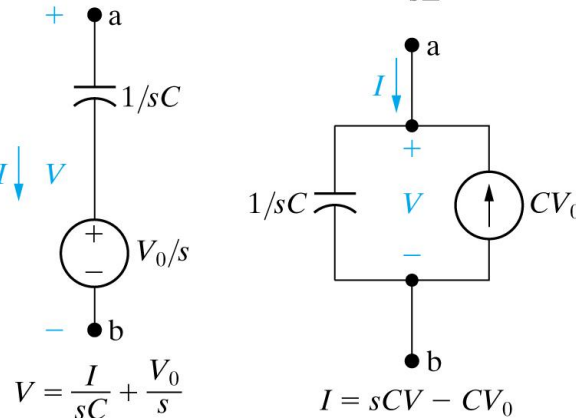
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Depolanmış başlangıç enerjisi sıfırsa



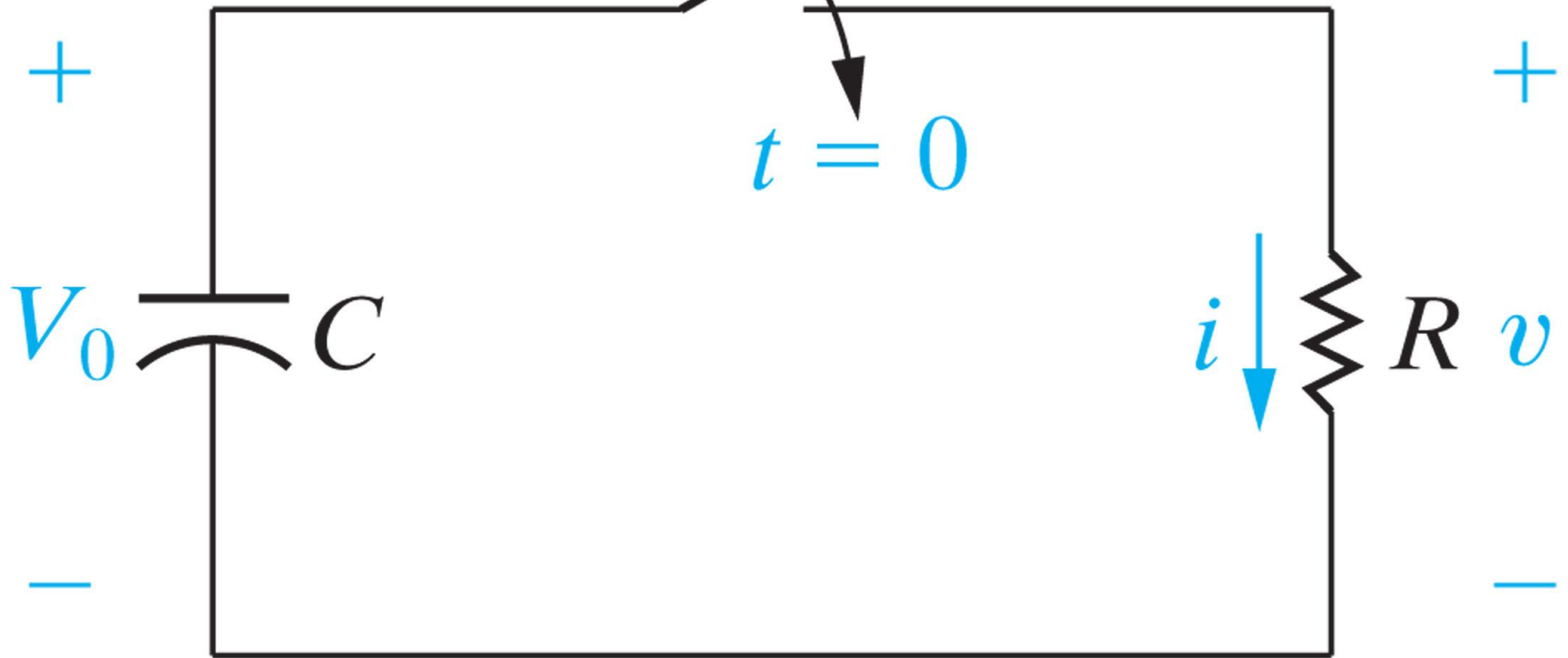
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TABLE 13.1 Summary of the s -Domain Equivalent Circuits

TIME DOMAIN	FREQUENCY DOMAIN
 $v = Ri$	 $V = RI$
 $v = L \frac{di}{dt},$ $i = \frac{1}{L} \int_0^t v dx + I_0$	 $V = sLI - LI_0$ $I = \frac{V}{sL} + \frac{I_0}{s}$
 $i = C \frac{dv}{dt},$ $v = \frac{1}{C} \int_0^t i dx + V_0$	 $V = \frac{I}{sC} + \frac{V_0}{s}$ $I = sCV - CV_0$

s Bölgesinde Devre Analizi ve Uygulamalar

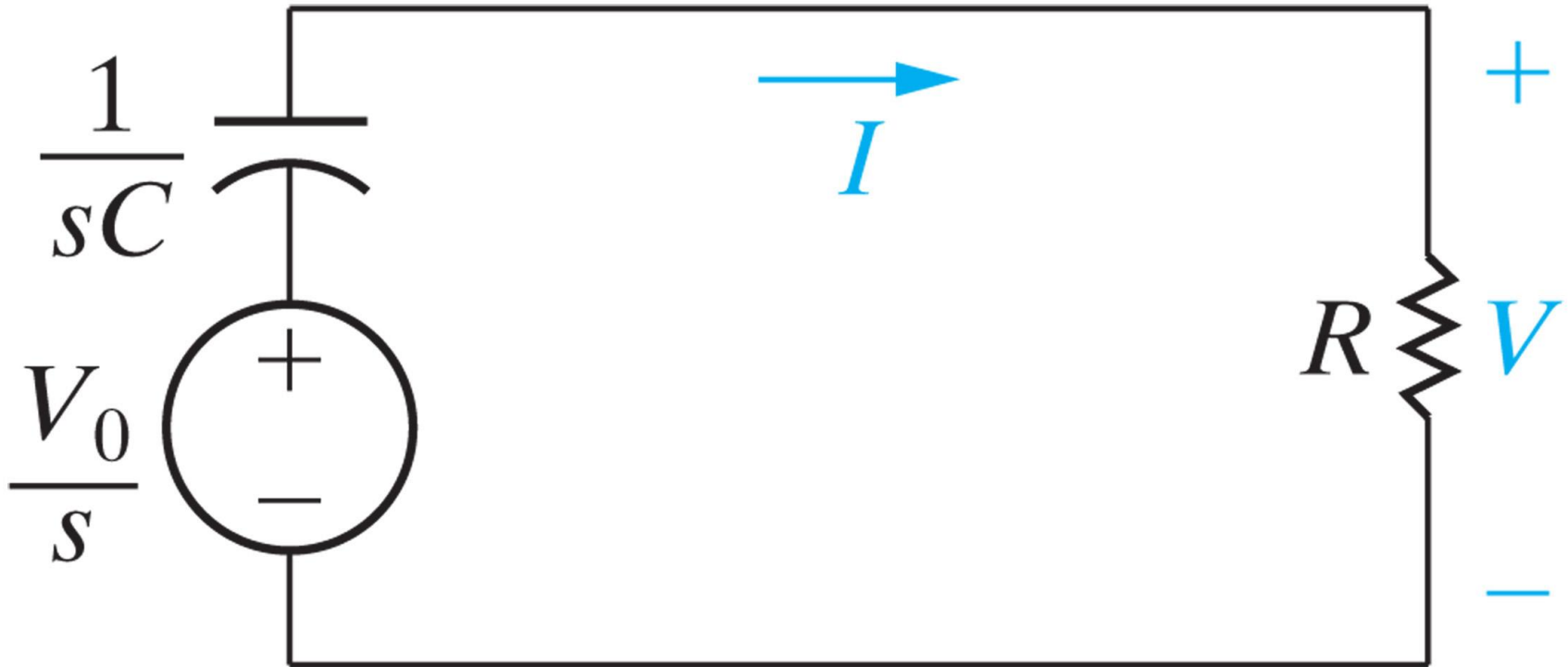
RC Devrenin Doğal Tepkisi



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RC Devrenin Doğal Tepkisi

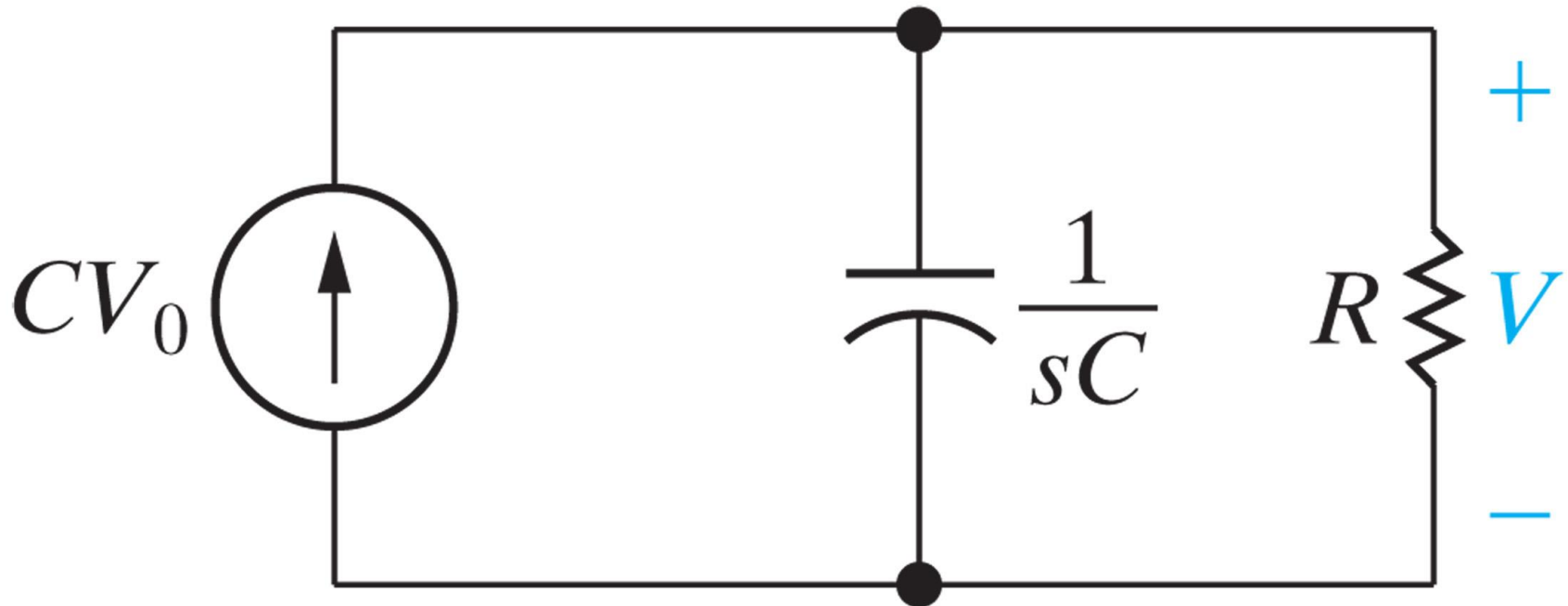
RC devresinin s bölgesinde seri eşdeğer gösterimi



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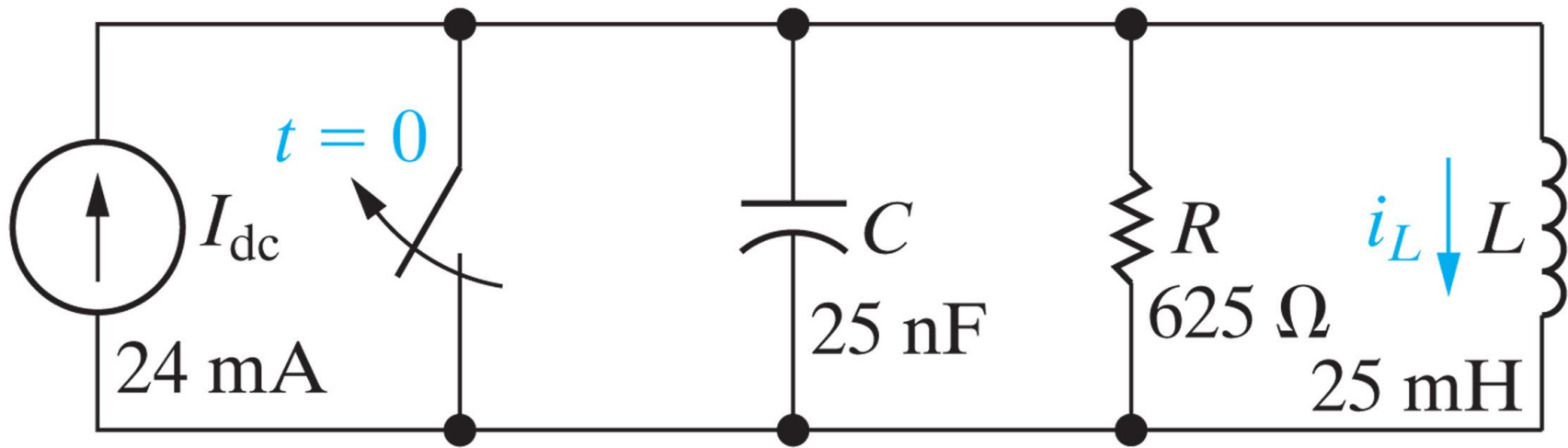
RC Devrenin Doğal Tepkisi

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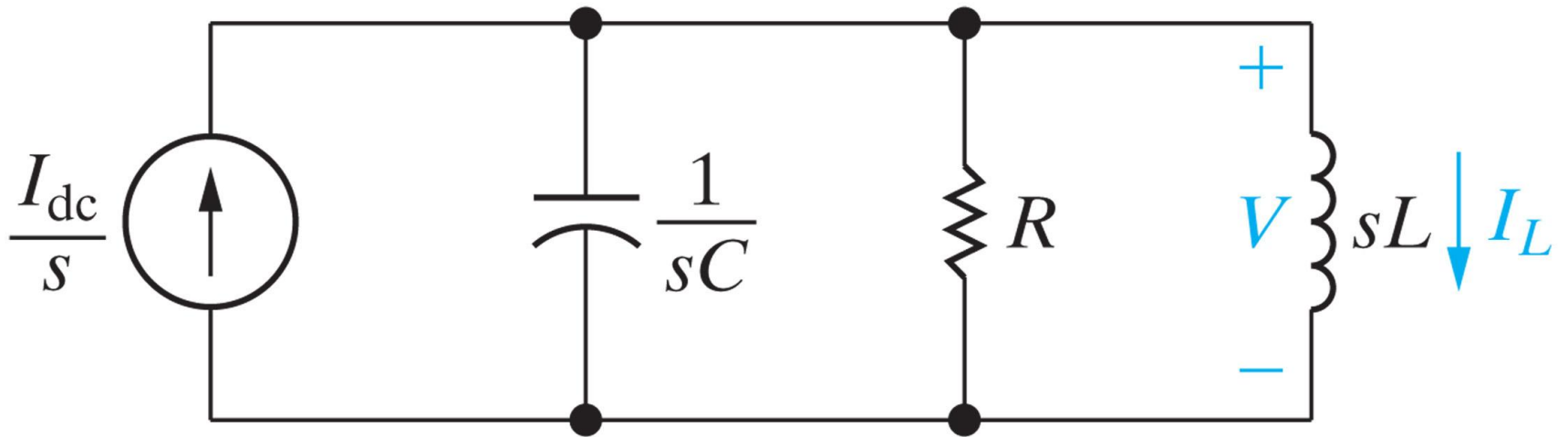
Paralel Devrenin Doğal Tepkisi



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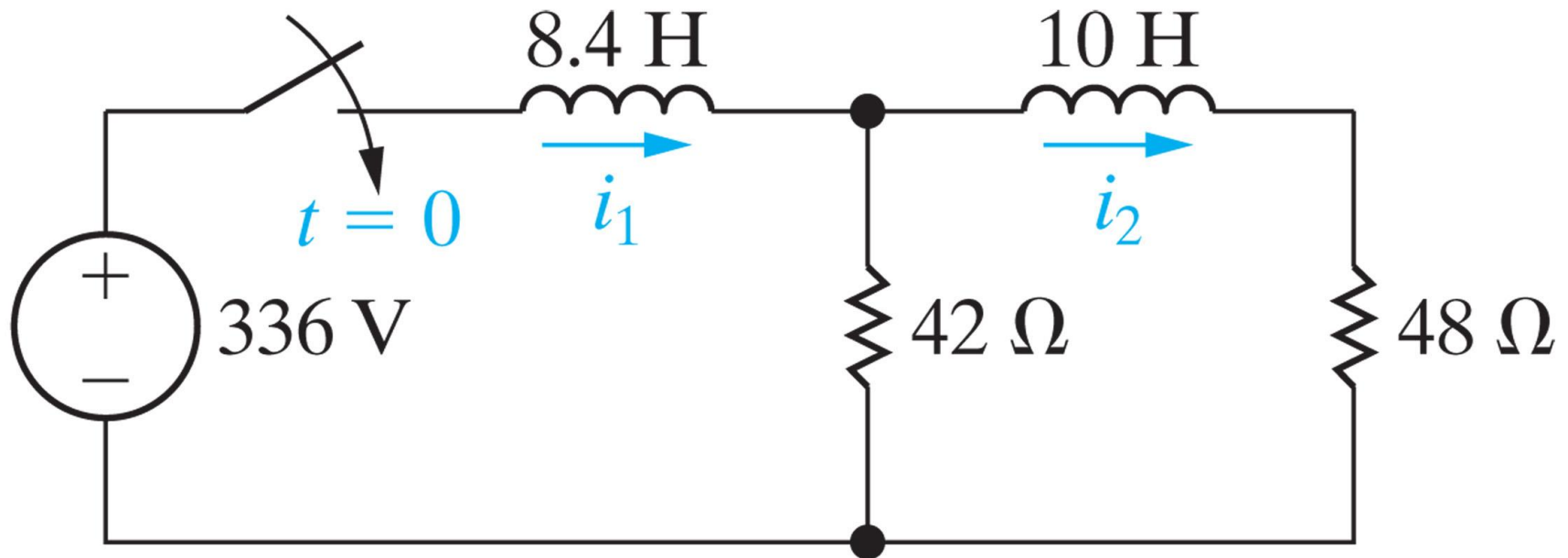
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Paralel devrenin s bölgesi eşdeğeri



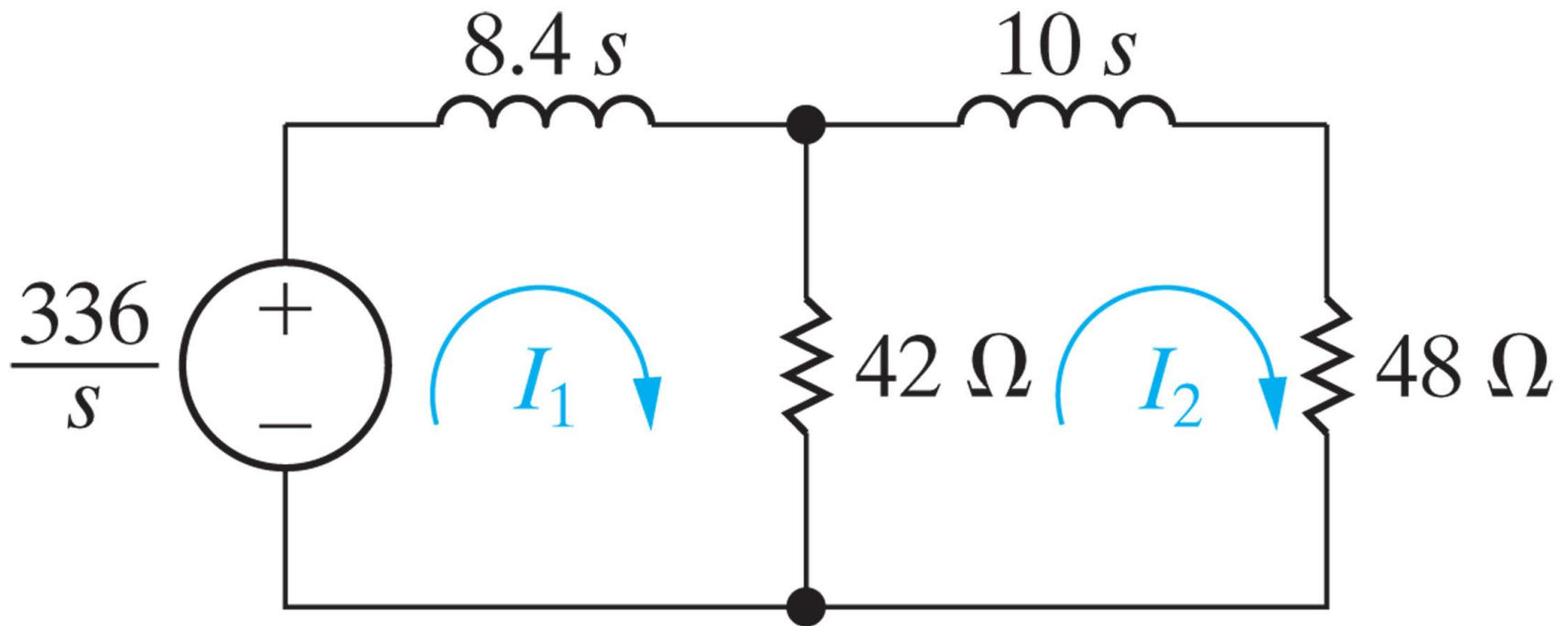
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Çok Ağılı Bir Devrenin Basamak Tepkisi



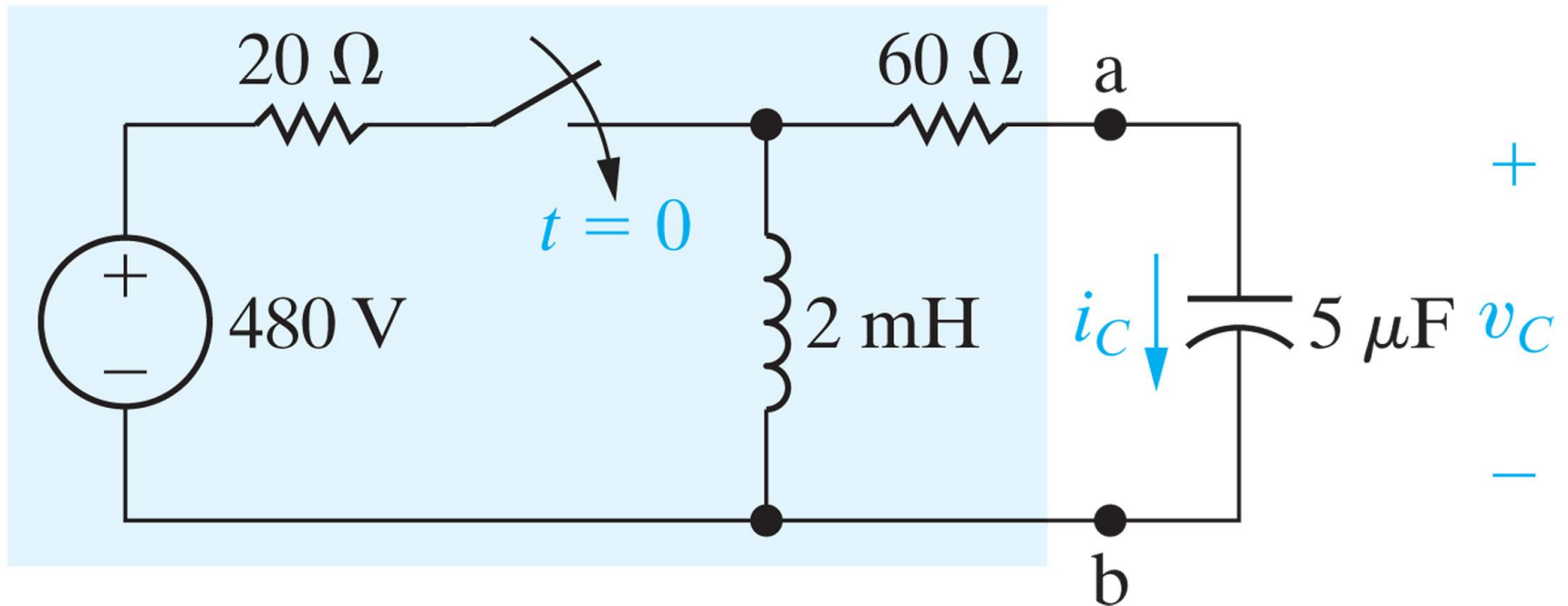
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Çok Ağılı Bir Devrenin Basamak Tepkisi



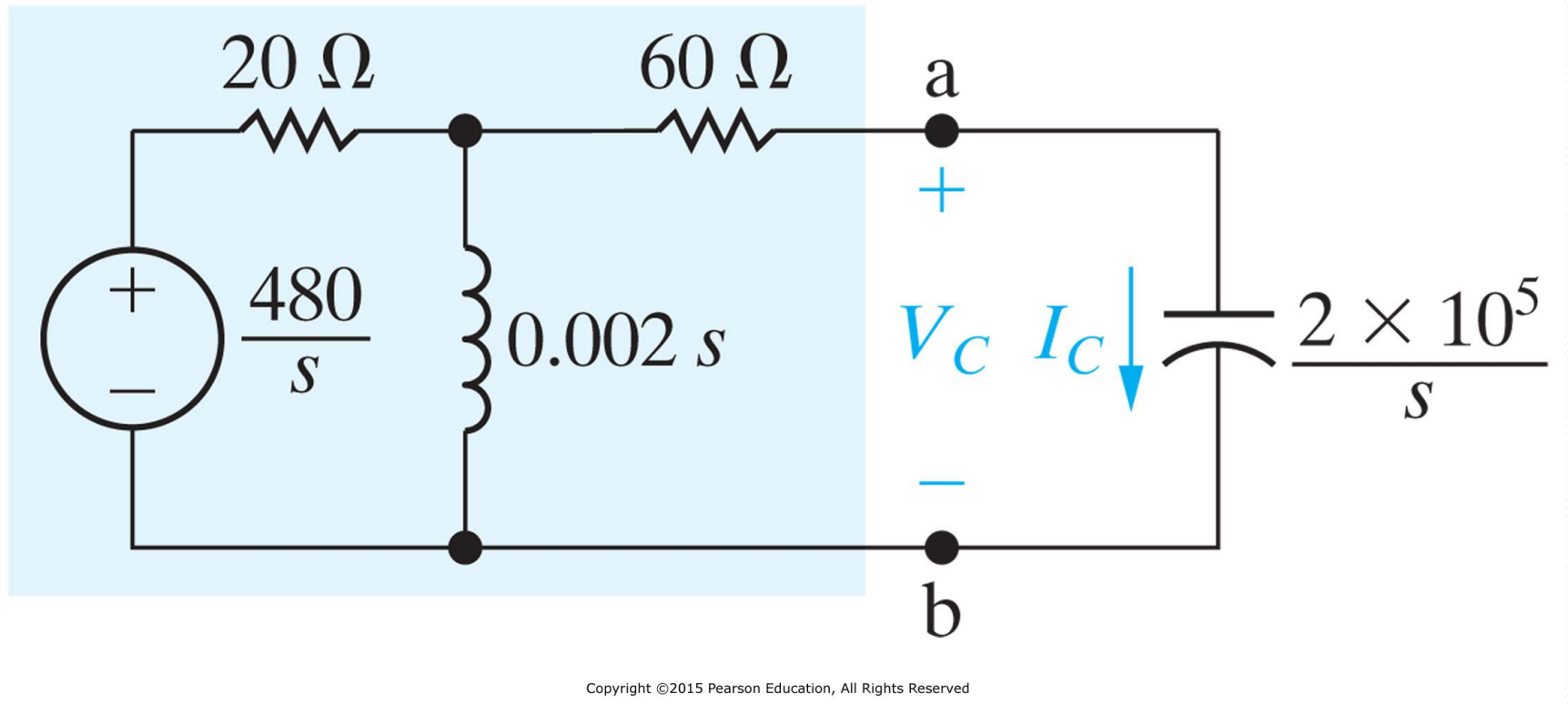
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Thevenin Eşdeğerin Kullanımı

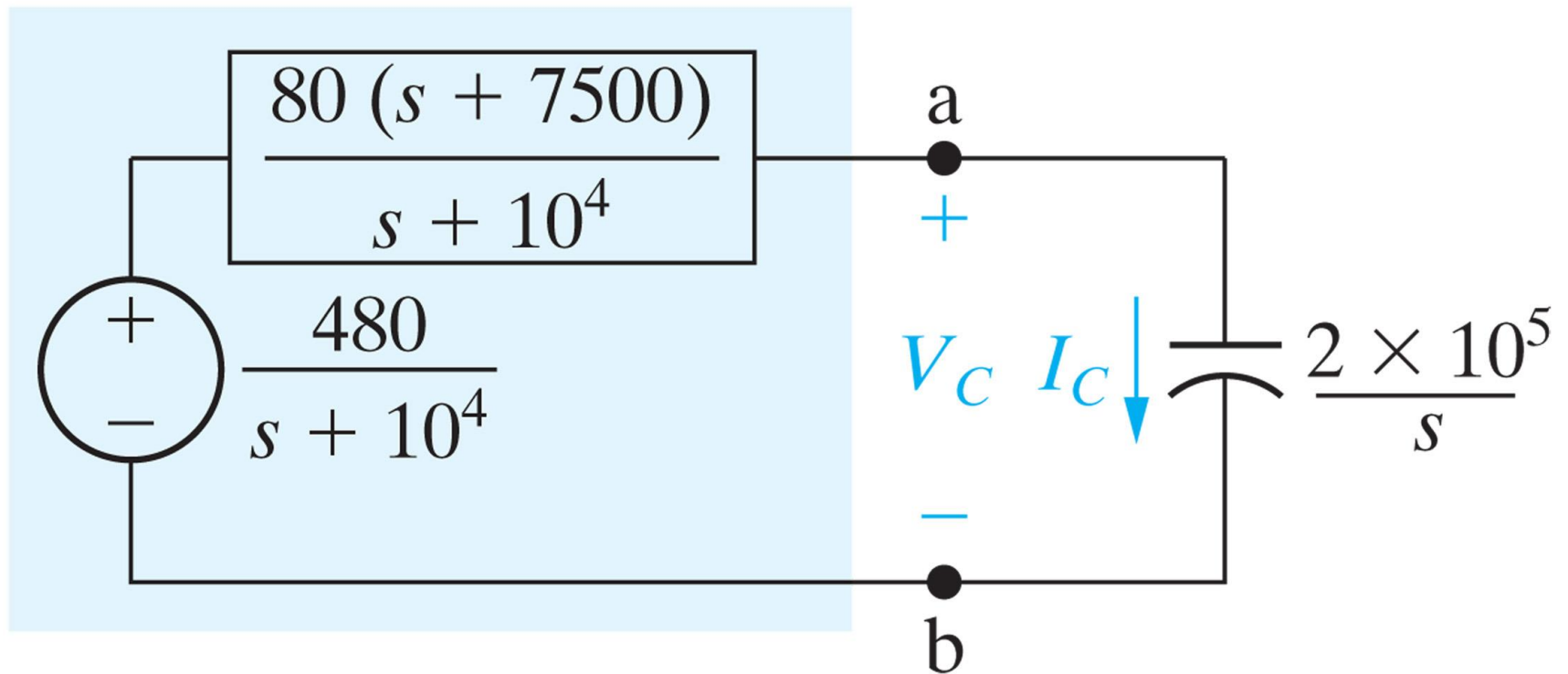


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Thevenin Eşdeğerin Kullanımı

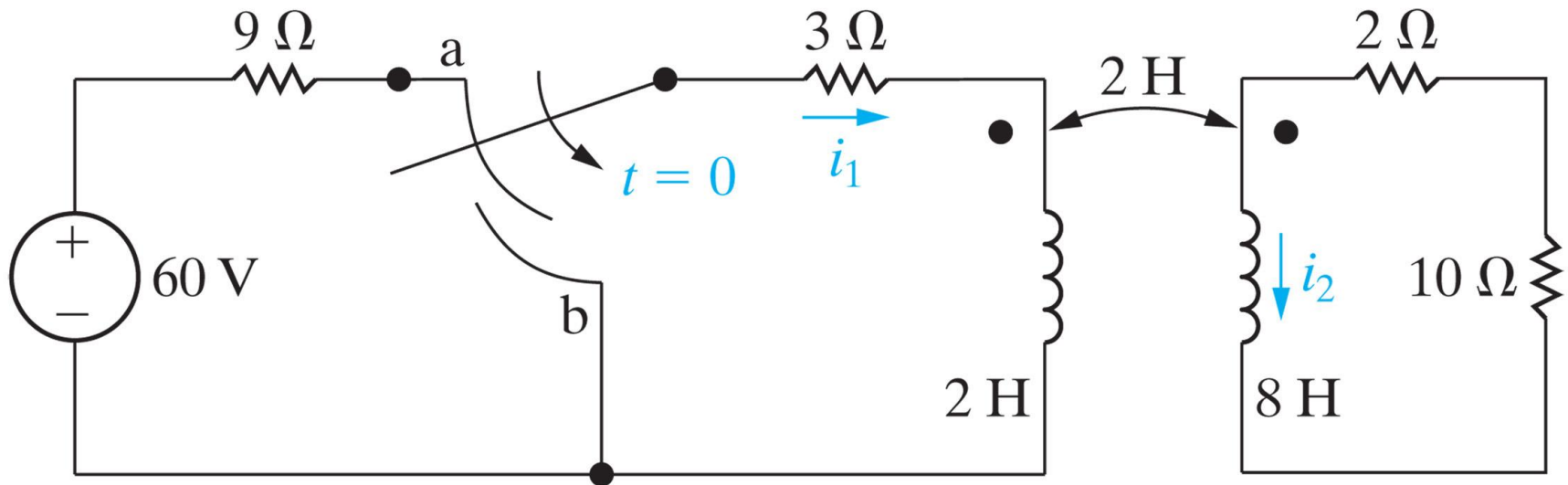


Thevenin Eşdeğerin Kullanımı



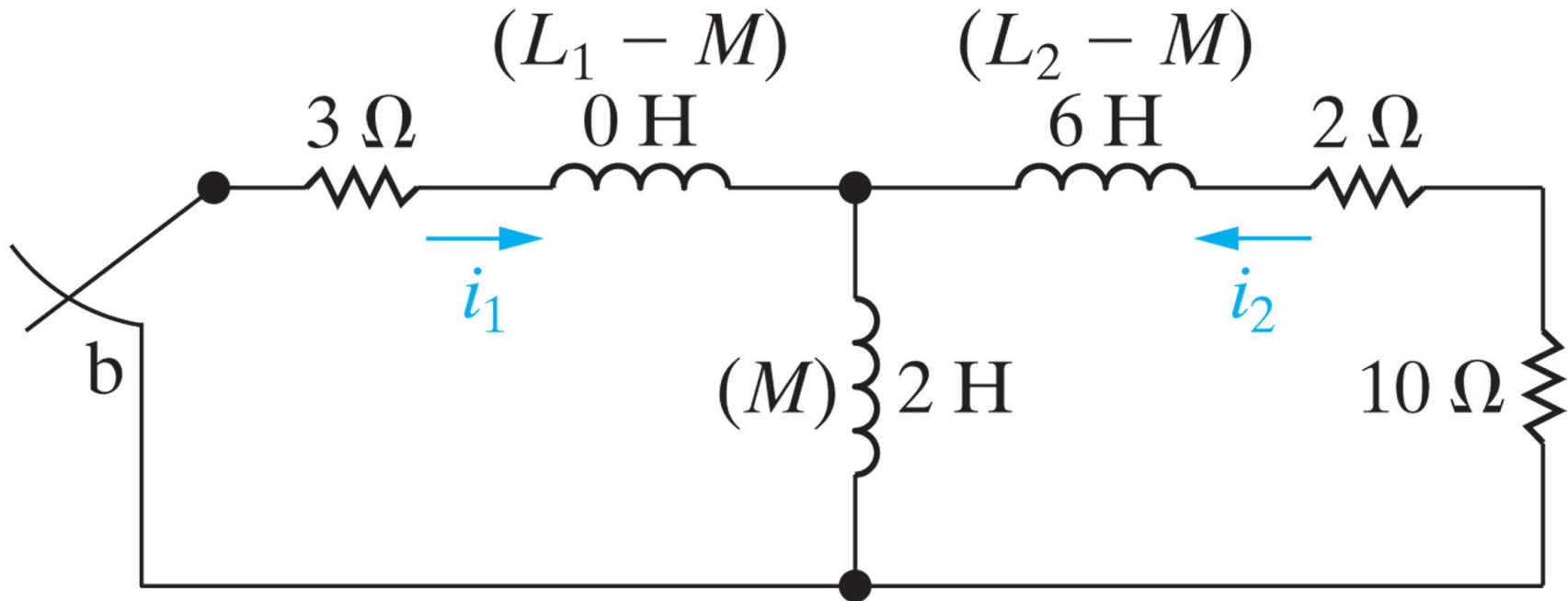
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Karşılıklı Endüktanslı Bir Devre



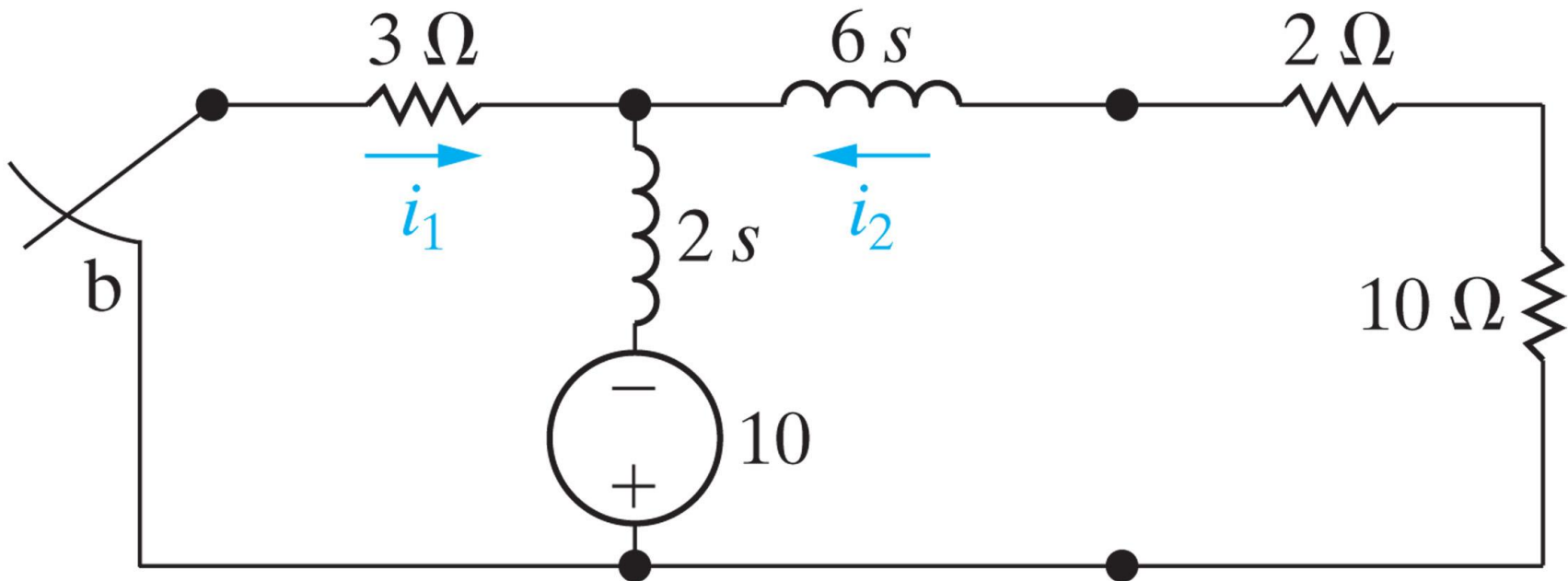
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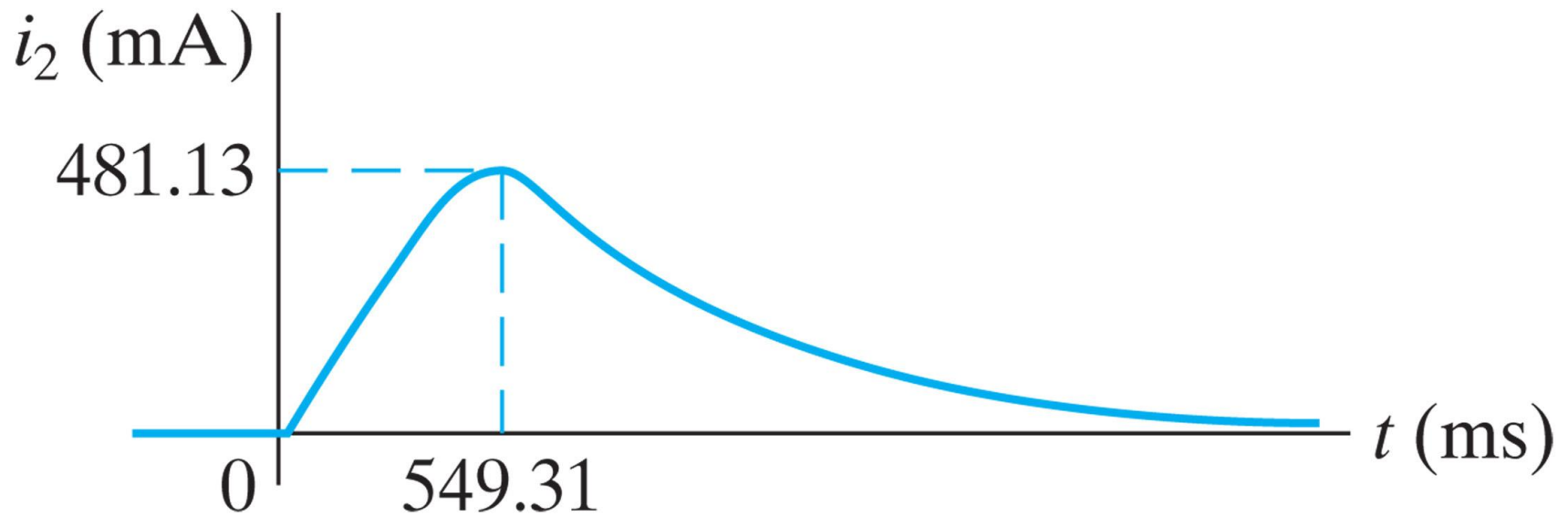
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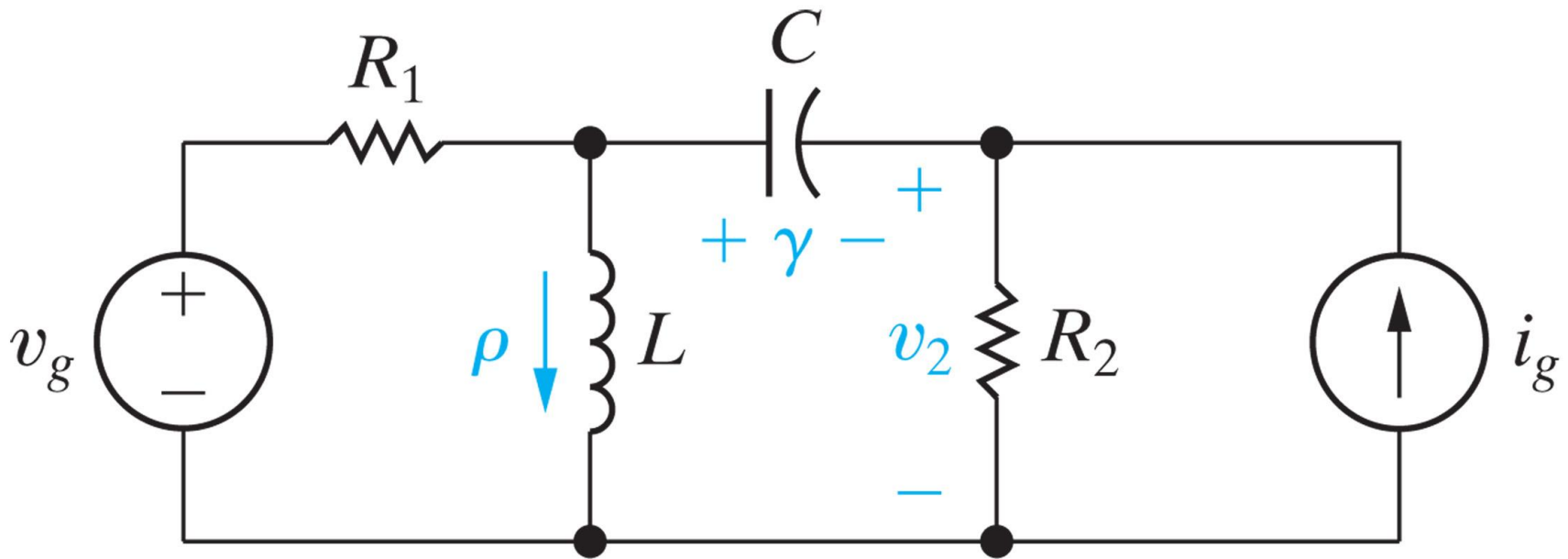
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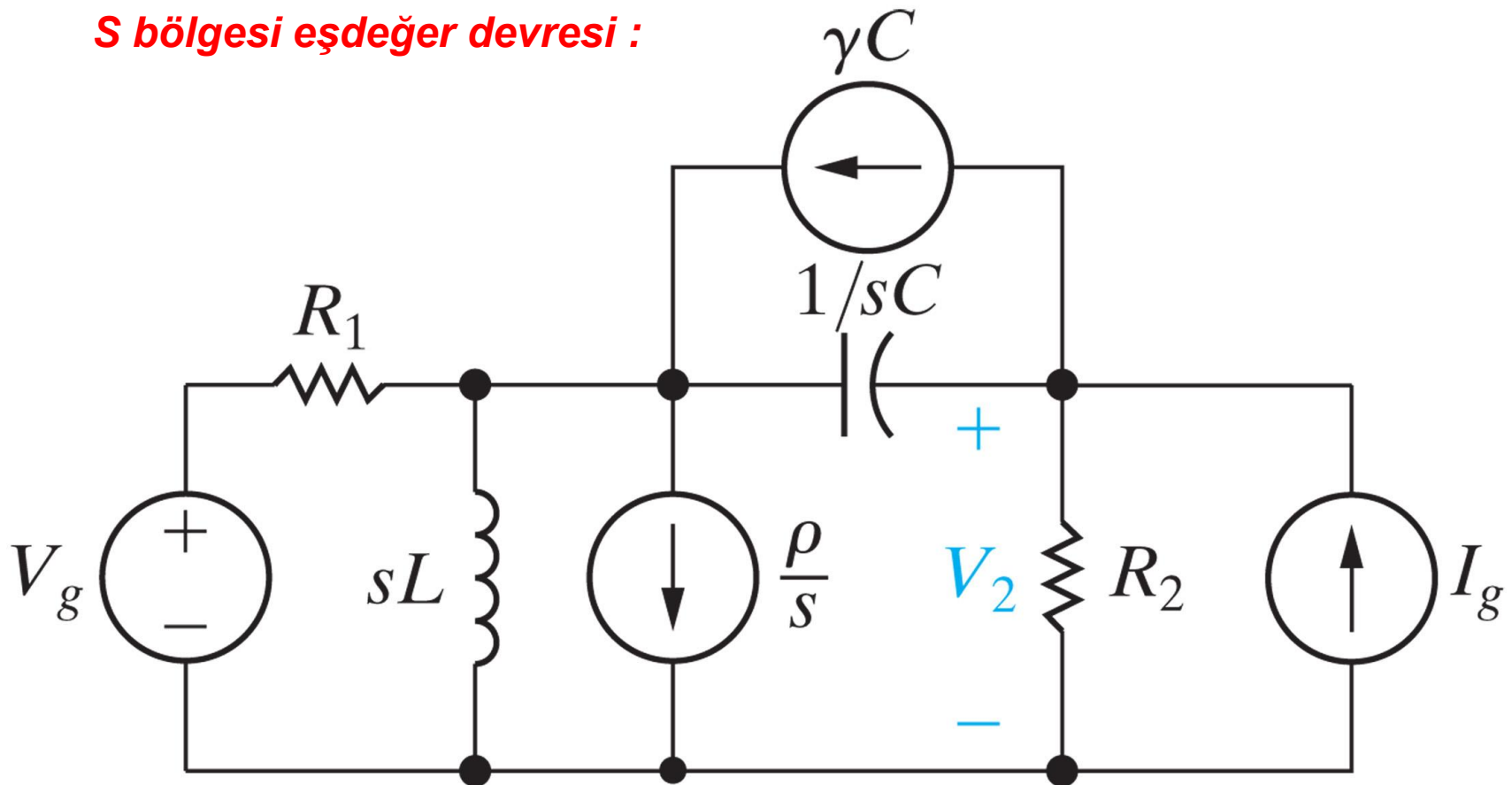
Süper pozisyon kullanımı



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Süper pozisyon kullanımı

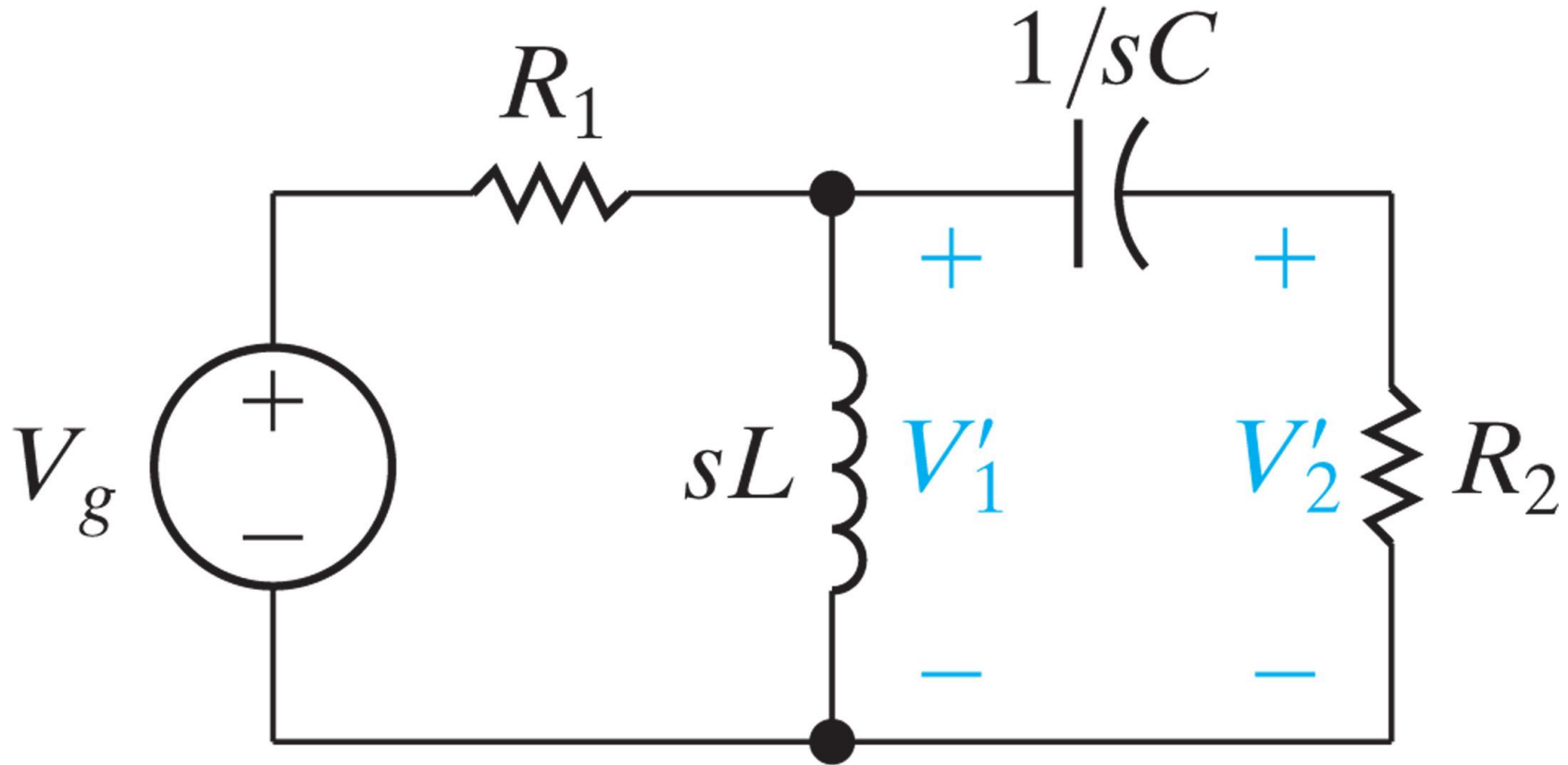
S bölgesi eşdeğer devresi :



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Süper pozisyon kullanımı

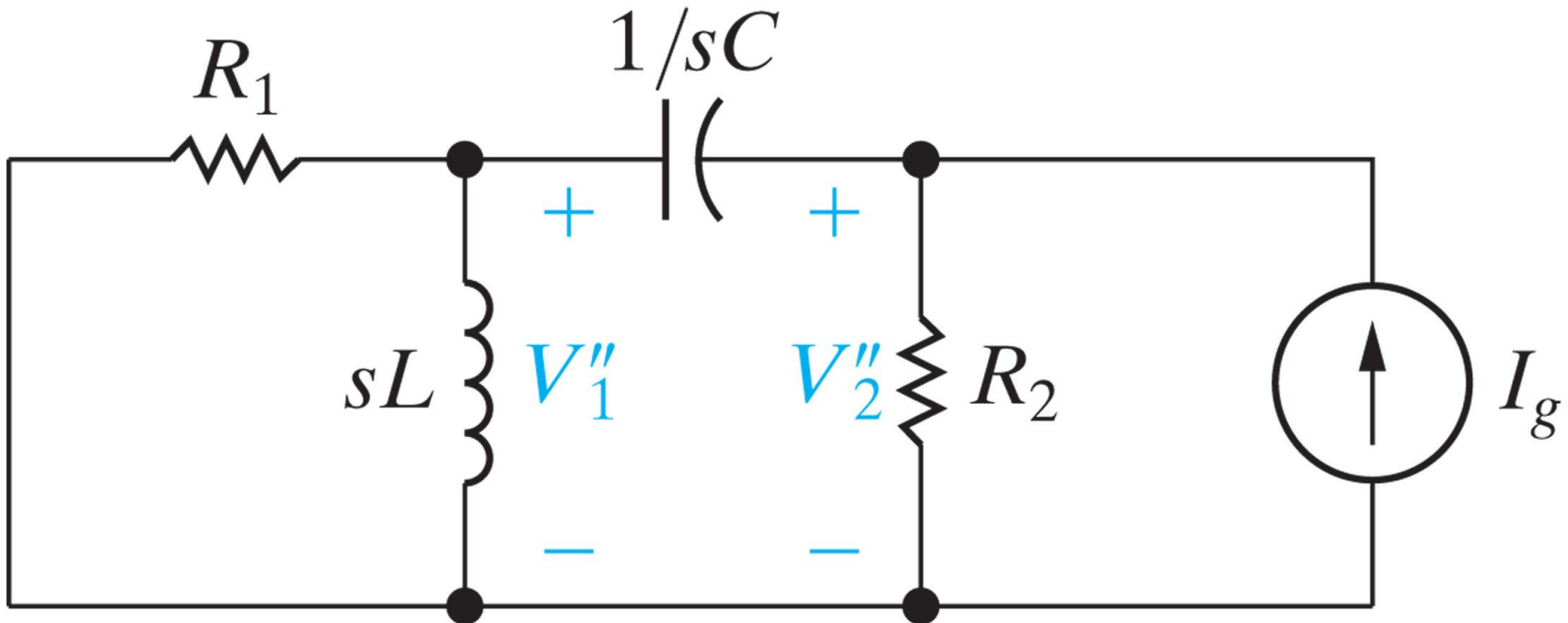
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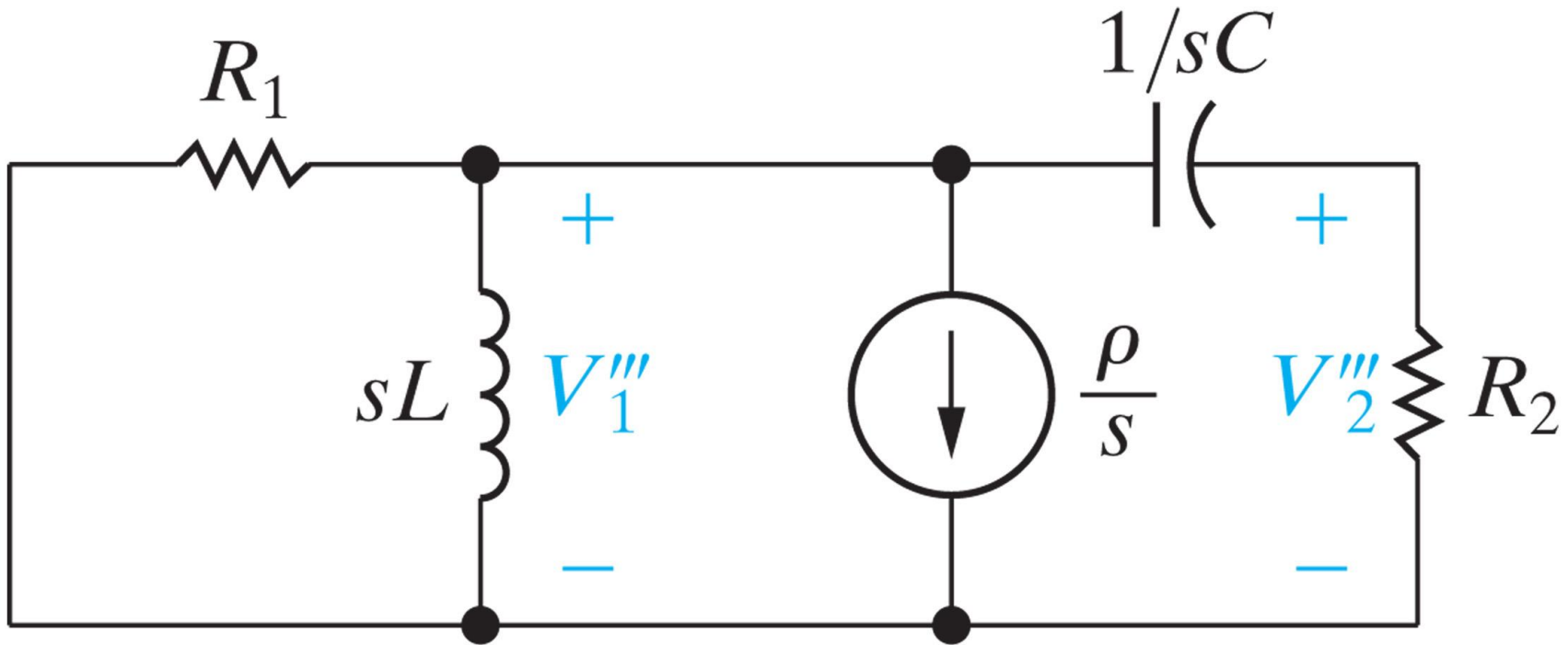
Sadece devrede I_g gerilim kaynağı bırakılırsa:



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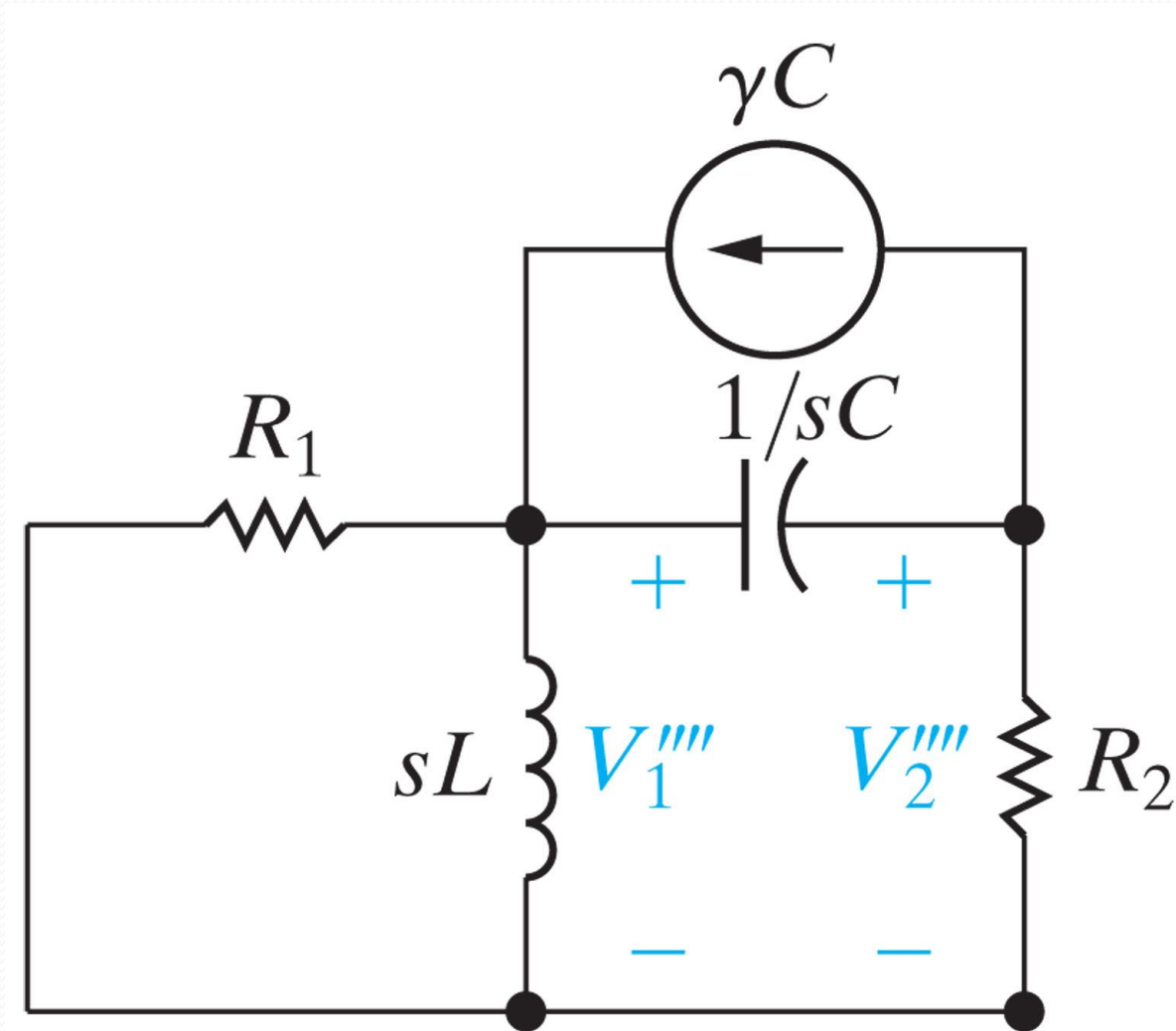
Sadece devrede endüktansın başlangıç akım kaynağı bırakılırsa:



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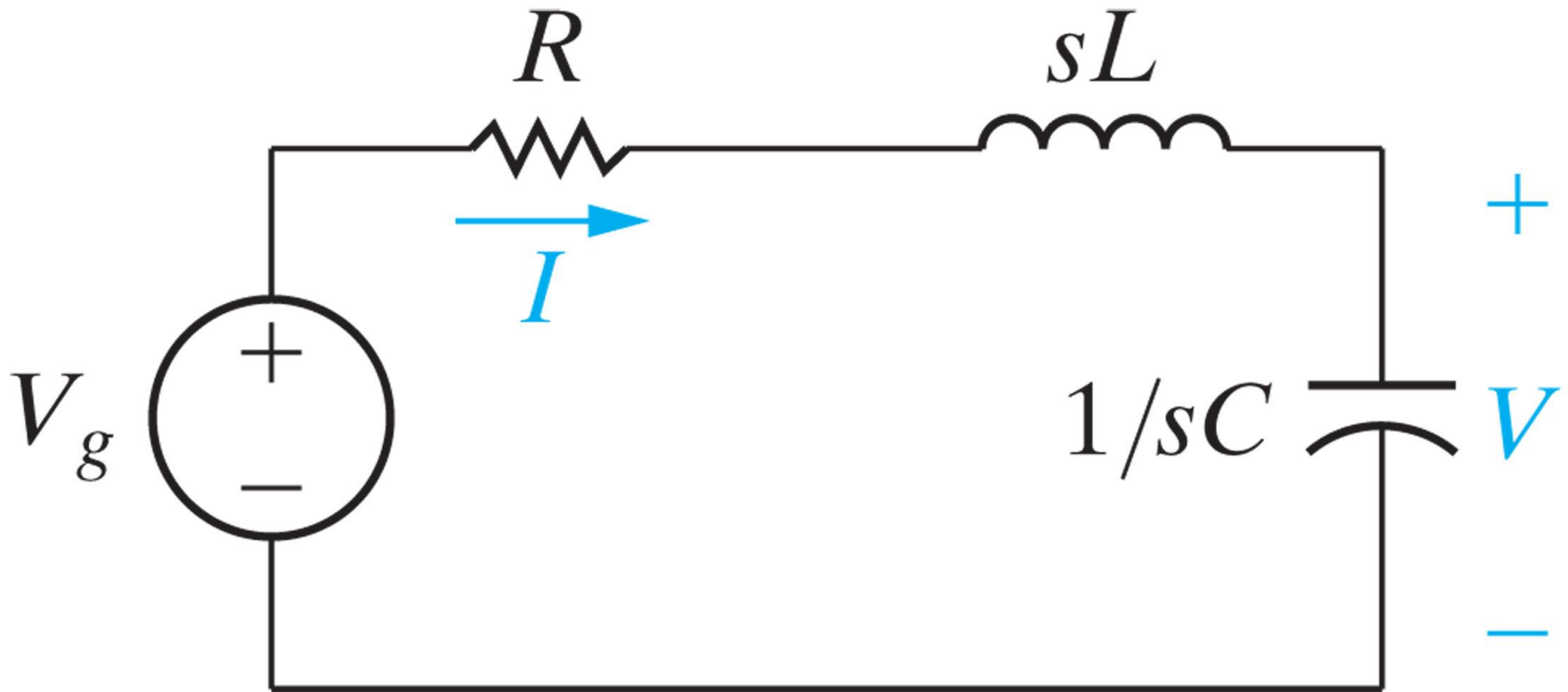
Süper pozisyon kullanımı

Sadece devrede kondansatörün başlangıç akım kaynağı bırakılırsa:



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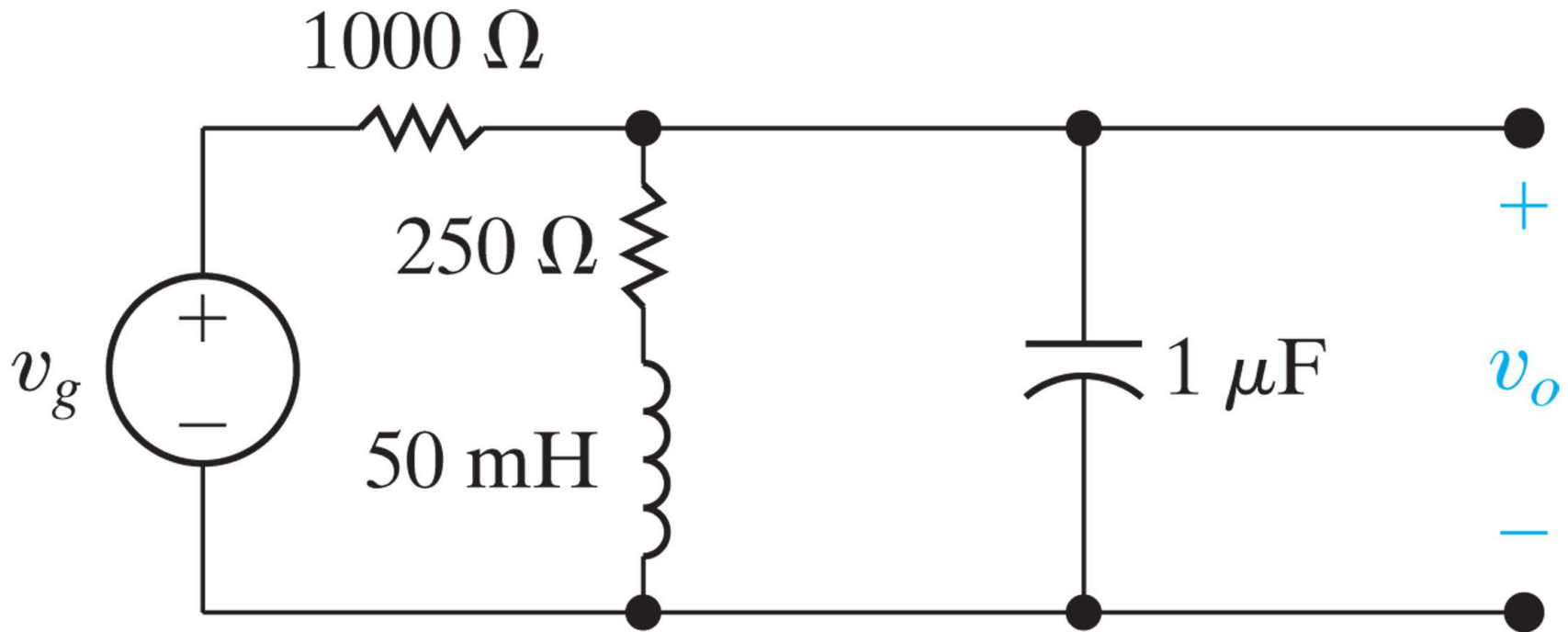
Transfer (Aktarım) Fonksiyonu



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Transfer Fonksiyonu

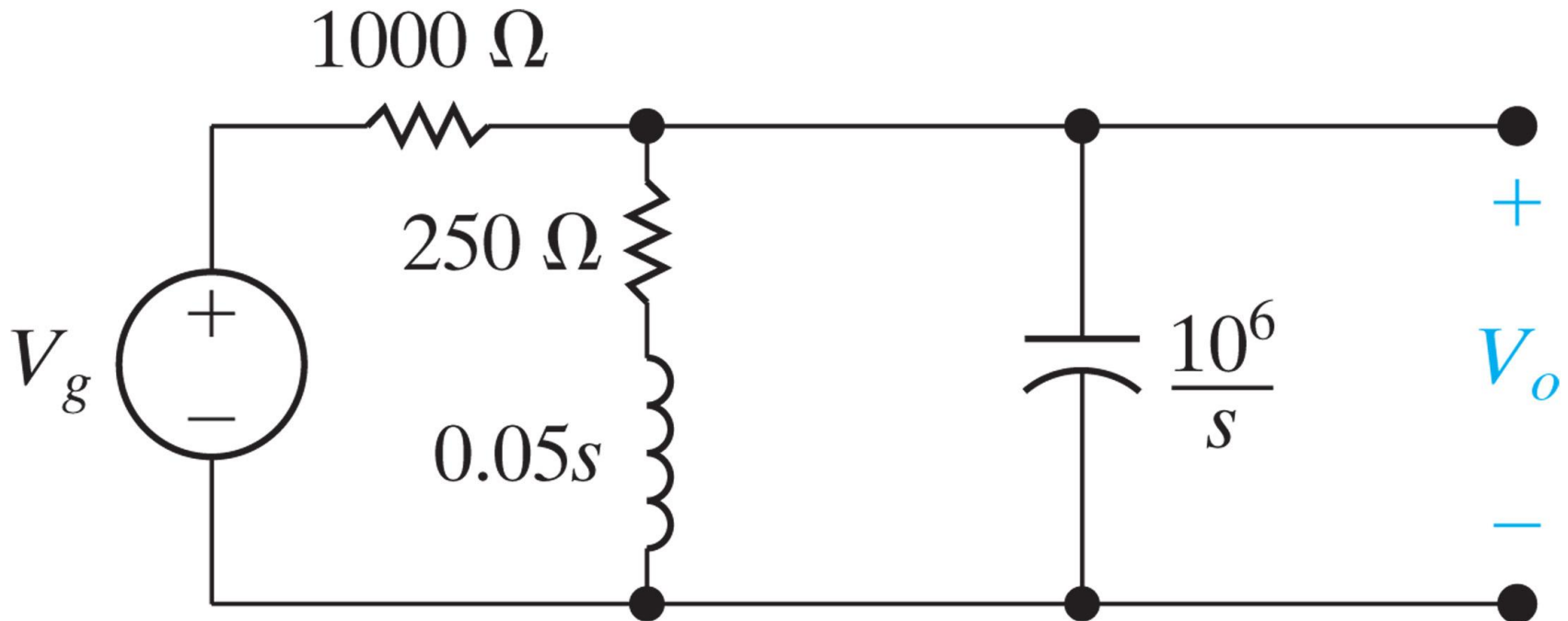
Örnek:



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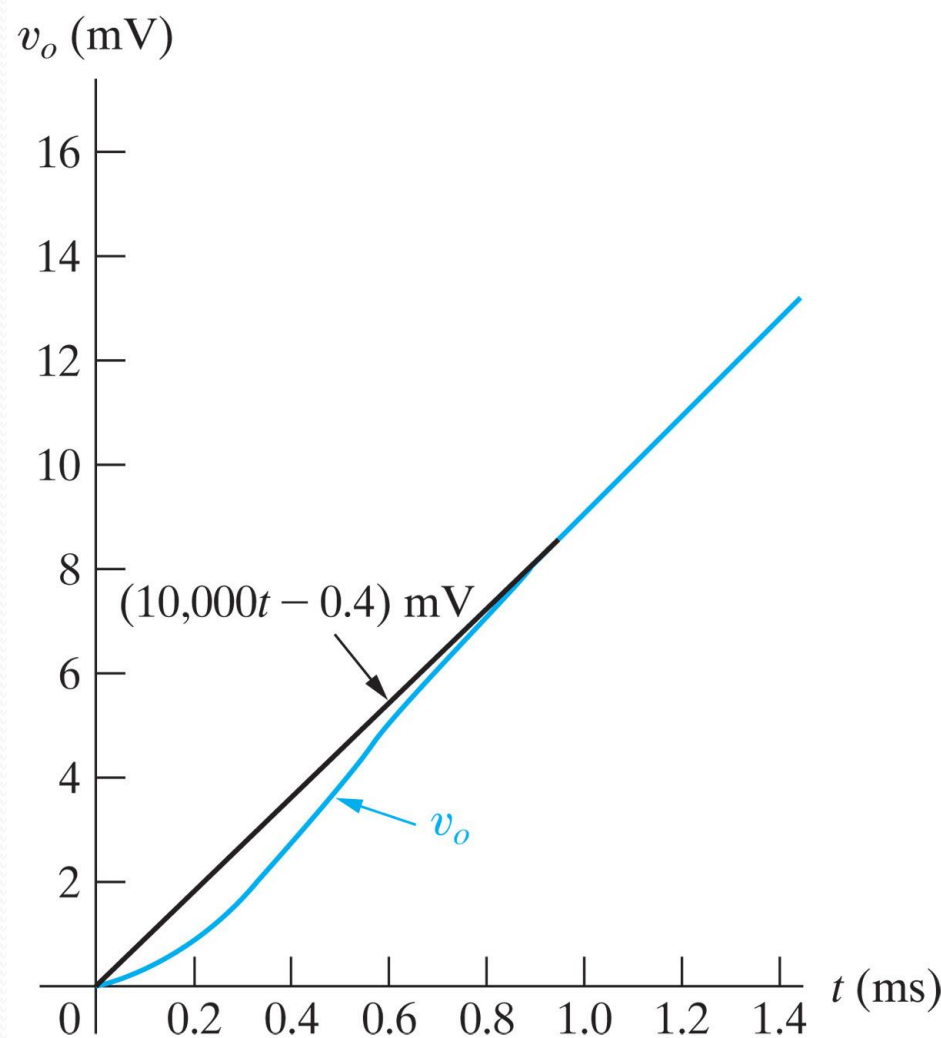
Transfer Fonksiyonu

Örneğe devam :



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Kısmi Kesir Açılım ve Transfer Fonksiyonu



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