1. **Mencione 4 razones por que estudiantes de otras ingenierías necesitan aprender los fundamentos de la ingeniería eléctrica.**

1. para revalida
2. paara trabajo en equipo
3. para comunicarse bien con otros
4. para poder evaluar a otros bien
5. para que no los engañen

3. Con un amperímetro mides la corriente que fluye por un cable y lees -5A. ¿Qué significa el signo negativo? ¿Cuánta carga fluye por una sección transversal del cable en 3 segundos?

El negativo significa que los contactos se pusieron al reves

$$I = \frac{\Delta Q}{\Delta t} \Rightarrow \Delta Q = I \Delta t$$

$$= (5A)(3s) = 15C$$

$$\Delta Q = 15C$$

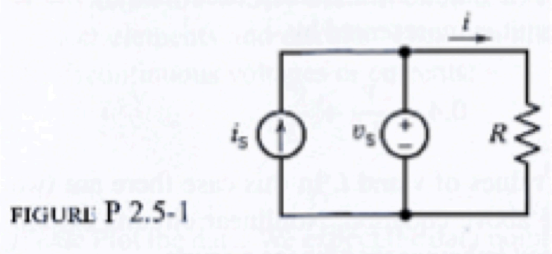
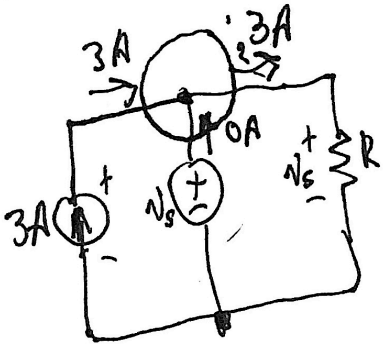


FIGURE P 2.5-1

P2.5-1 A current source and a voltage source are connected in parallel with a resistor as shown in Figure P2.5-1. All of the elements connected in parallel have the same voltage, v_s in this circuit. Suppose that $v_s = 15$ V, $i_s = 3$ A, and $R = 5\ \Omega$.
(a) Calculate the current i in the resistor and the power absorbed by the resistor.
(b) Change the current source current to $i_s = 5$ A and recalculate the current, i, in the resistor and the power absorbed by the resistor.

$V = IR$ Ley de Ohm

a) $i = \frac{V_s}{R} = \frac{15V}{5\Omega} = 3A$



$P_R = V_s i = (15V)(3A) = 45W$

$P_{V_s} = V_s(0) = 0W$

$P_{I_s} = -(15V)(3A) = -45W$

formula no cambia

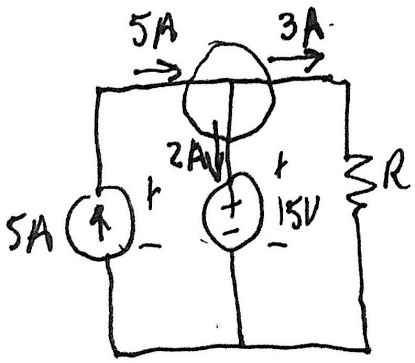
b) $i = \frac{V_s}{R} = \frac{15V}{5\Omega} = 3A$,

formula no cambia

$P_R = V_s i = (15V)(3A) = 45W$

$P_{V_s} = V_s(2A) = 15(2) = 30W$

$P_{I_s} = (15V)(-5) = -75W$



Buscamos las potencias para las fuentes y vemos que cambio

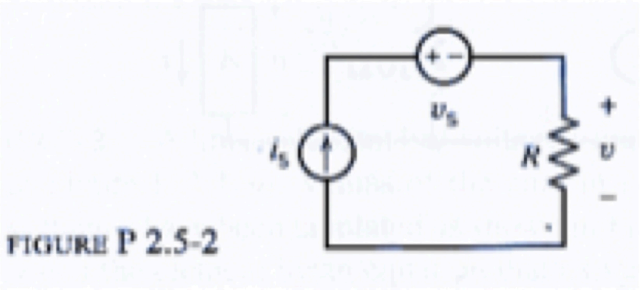


FIGURE P 2.5-2

P2.5-2 A current source and a voltage source are connected in series with a resistor as shown in Figure P 2.5-2. All of the elements connected in series have the same current, i_s, in this circuit. Suppose that $v_s = 10$ V, $i_s = 2$A, and $R = 5\ \Omega$.
(a)
Calculate the voltage v across the resistor and the power absorbed by the resistor.
(b) Change the voltage source voltage to $v_s = 5$ V and recalculate the voltage, v, across the resistor and the power absorbed by the resistor.

a) $v = i_s R = (2A)(5\Omega) = 10V$, $P_R = v i_s = (10V)(2A) = 20W$

$P_{V_s} = (10V)(2A) = 20W$

$P_{I_s} = (10V + 10V)(-2A) = -40W$

formula no cambia

formula no cambia

b) $v = i_s R = 10V$, $P_R = v i_s = 20W$

$P_{V_s} = (5V)(2A) = 10W$

$P_{I_s} = (5+10)(-2A) = -30W$

Buscamos las potencias para las fuentes y vemos que cambio

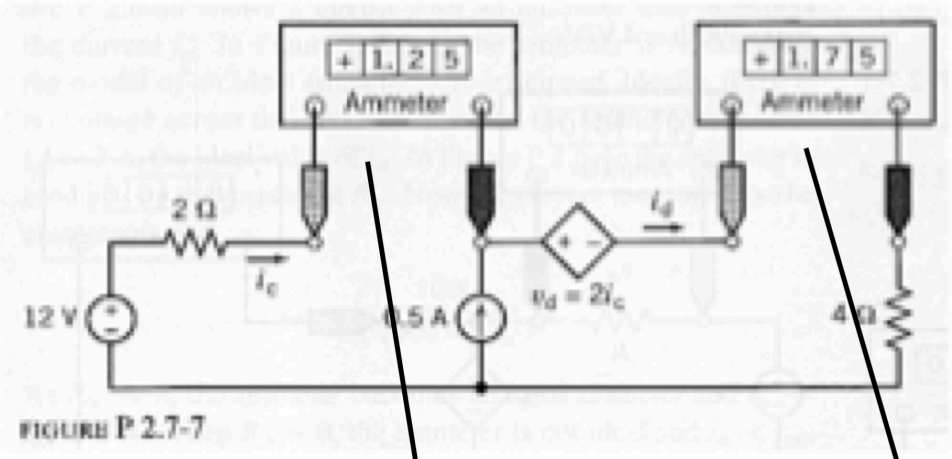
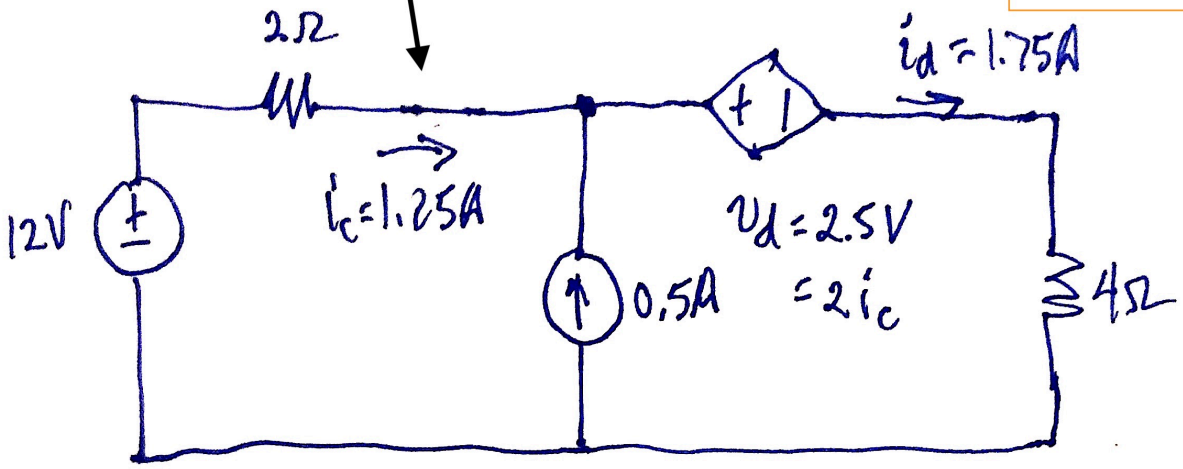


FIGURE P 2.7-7

P 2.7-7 Find the power absorbed by the CCVS in Figure P 2.7-7.

Sustituir valores de las corrientes

entra por el terminal positivo



$$P_{v_d} = (2.5V)(1.75A) = 4.375\,W$$

cifras correctas son las que menos aparecen.

$$\frac{4.4}{4.38}$$

P2.34. The 9-V source in Figure P2.34 is delivering 27 W of power. All three resistors have the same value R. Find the value of R.

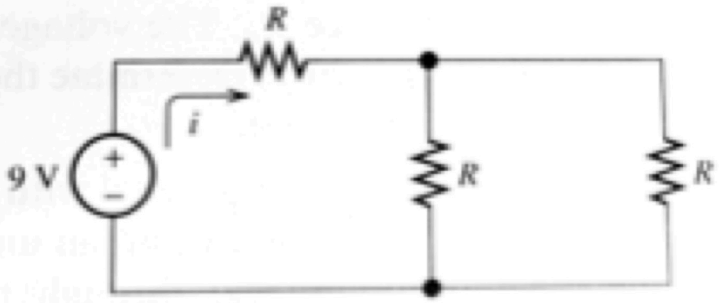


Figure P2.34

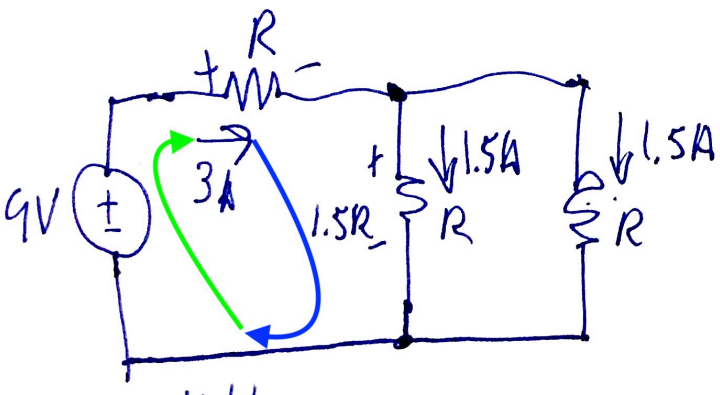
$P = 27W$

$V = 9V$

$i = \frac{P}{V} = \frac{27W}{9V} = 3A$

p = vi

$V_R = 3R$



Voltajes

$9V = 3R + 1.5R = 4.5R$

$R = \frac{9V}{4.5} = 2\Omega$

Verificando usando potencias da igual

Potencias $p = i^2R$

$27W = 9R + 2.25R(2)$

$+4.5R$

$27 = 13.5R$

$2\Omega = R$

***P2.47.** Write equations and solve for the node voltages shown in Figure P2.47. Then, find the value of i_1.

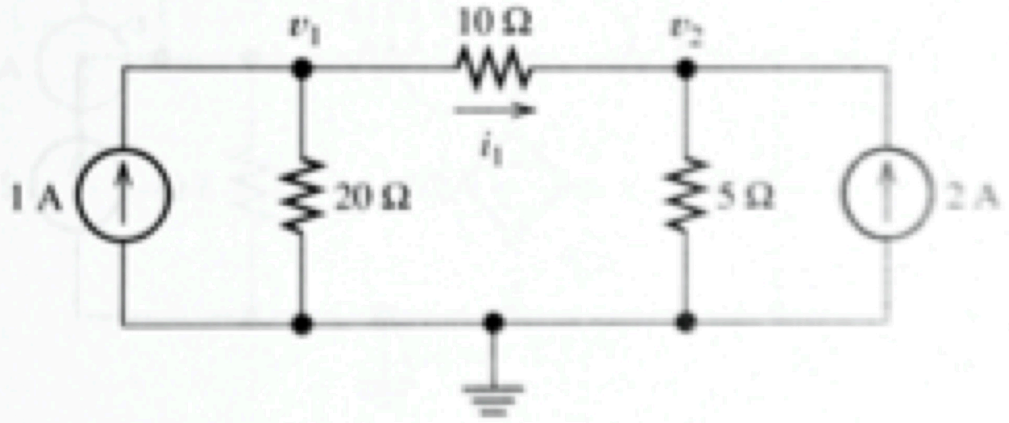


Figure P2.47

$$V_1: \quad 1 = V_1\left(\frac{1}{20} + \frac{1}{10}\right) - V_2\left(\frac{1}{10}\right)$$

$$V_2: \quad 2 = V_2\left(\frac{1}{5} + \frac{1}{10}\right) - V_1\left(\frac{1}{10}\right)$$

$$i_1 = \frac{V_1 - V_2}{10}$$

V1 = 14.28 V, V2 = 11.43V, i1 = 0.285A

P2.62. Solve for the power delivered by the voltage source in Figure P2.62, using the mesh-current method.

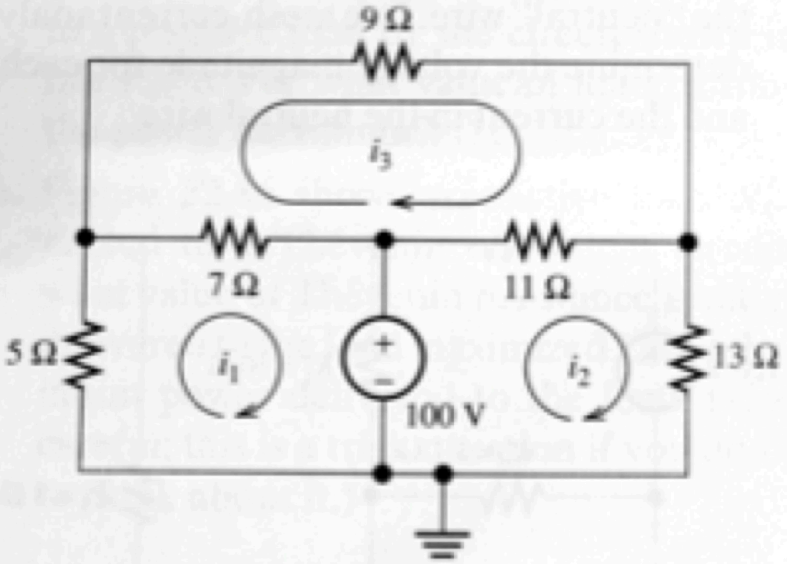


Figure P2.62

$$i_1: \quad -100 = i_1(5+7) - i_3(7)$$

$$i_2: \quad 100 = i_2(11+13) - i_3(11)$$

$$i_3: \quad 0 = i_3(7+9+11) - i_1(7) - i_2(11)$$

$$P_{100V} = (100)(i_2 - i_1)$$

i1 = -8.734A i2 = 3.847A i3 = -0.697A P100v = 1260W