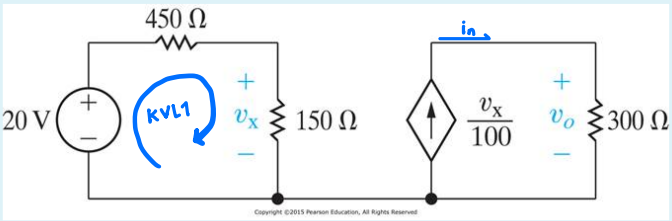
1.



P2.33_10ed

a) Find v_0.

v_0 = 15 ✔ Volts

b) Find the total power absorbed in the circuit.

P_{total} = 1.417 ✔ Watts

KVL1 : $-20V + i(450\Omega) + i(150\Omega) = 0$

$i = \frac{1}{30}A$

$V_x = (\frac{1}{30}A)(150\Omega) = 5V$

$i_n = V_x/100 = 5/100 = 0.05\,A$

$V_o = i_n(300\Omega) = (0.05A)(300\,A)$

$V_o = 15\,V$

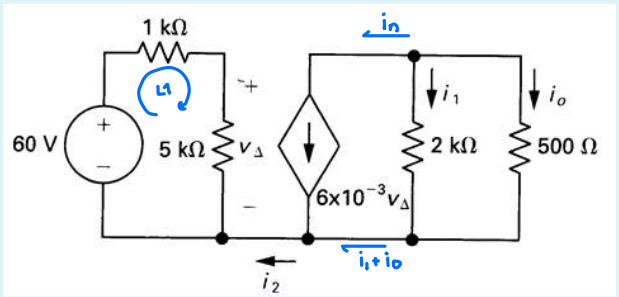
TOTAL POWER ABSORBED:

$P_T = P_{450\Omega} + P_{150\Omega} + P_{300\Omega}$ $\quad P = i^2V = V^2/R$

$= (1/30\,A)^2(450\Omega) + (1/30\,A)^2(150\Omega) + (15V)^2/300\Omega$

$P_T = 17/12 \approx 1.417\,W$

2.



P2.26_6ed

a) Find the current i_2.

i_2 = 0 ✔ A

b) Find voltage v_D.

v_Δ = 50 ✔ V

c) Find the current i_0.

i_0 = -240 ✔ mA (milli A)

L1 : $-60V + i(1000\Omega) + i(5000\Omega) = 0$

$i = 0.01\,A$

$V_\Delta = (0.01A)(5\,k\Omega) = 50V$

$i_n = 6x10^{-3}V_\Delta = (6x10^{-3})(50)$

$= 0.3\,A$

$i_2 = i_n - (i_1 + i_o)$

$= 0.3A - (0.06A + 0.24\,A)$

$i_2 = 0\,A$

$-V = i_1R_1 = i_oR_o$

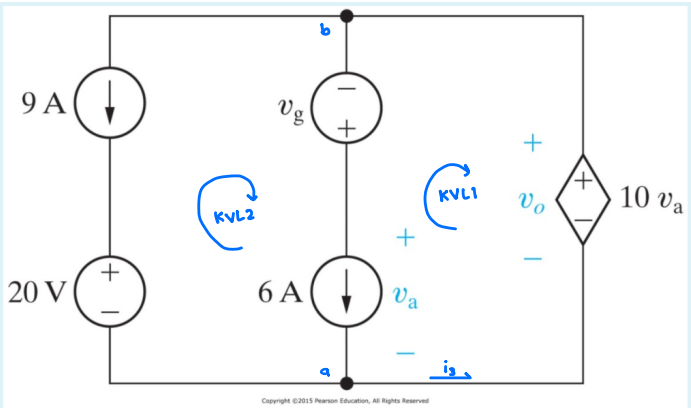
$-i_nR_{eq} = i_1R_1 = i_oR_o$

$-i_n(\frac{R_1R_o}{R_1+R_o}) = i_1R_1 = i_oR_o$

$i_1 = \frac{-i_nR_o}{R_1+R_o} = \frac{(0.3A)(0.5k\Omega)}{2k\Omega+0.5k\Omega} = -0.06\,A$

$i_o = \frac{-i_nR_1}{R_1+R_o} = \frac{(0.3A)(2k\Omega)}{2k\Omega+0.5k\Omega} = -0.24\,A$

3.



P2.10_10ed

Given that v_0 = 5 Volts.

Find the total power delivered in the circuit. $P_{del,total}$ = ?? W

Answer: -210 ✔

$V_o = 5\,V$

$V_o = 10V_a$

$V_a = 0.5\,V$

KVL : $-V_a + V_g + V_o = 0$

$V_g = V_a - V_o = 0.5V - 5V = -4.5V$

KVL : $-20V + V_{9A} - V_g + V_a = 0$

$V_{9A} = 20V + V_g - V_a$

$= 20V - 4.5V - 0.5V = 15V$

KCL Node a : $-9A - 6A + i_3 = 0$

$i_3 = 15A$

P_{del} : $P_{10V_a} = -(10V_a)\,i_3$

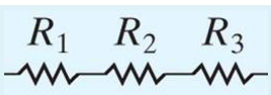
$= -(5V)(15A) = -75\,W$

$P_{9A} = -V_{9A}(9A)$

$-(15V)(9A) = -135\,W$

$-210\,W$

4.



CQ3.01

Given:

R_1 = 278053Ω (Ohms) R_2 = 89628 Ω (Ohms) R_3 = 51000 Ω (Ohms)

Find the equivalent resistance R_{Eq}.

R_{Eq} = ?? Ω (Ohms)

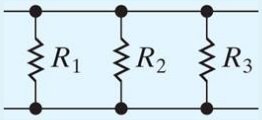
Answer: 418681 ✔

$R_{series} = R_1 + R_2 + R_3$

$= 278053\Omega + 89628\Omega + 51000\Omega$

$= 418681\Omega$

5



CQ3.02

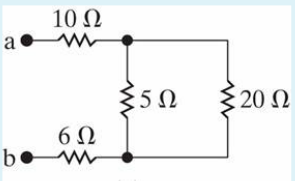
Given:

R_1 = 29466 Ω (Ohms) R_2 = 450479 Ω (Ohms) R_3 = 3569 Ω (Ohms)

Find the equivalent resistance R_{Eq}.

R_{Eq} = ?? Ω (Ohms)

Answer: 3161.078 ✔

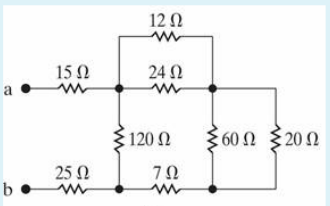


P3.05a_9ed

Find the equivalent resistance seen looking into terminals a,b.

R_{Eq} = ?? Ω (Ohms)

Answer: 20 ✔

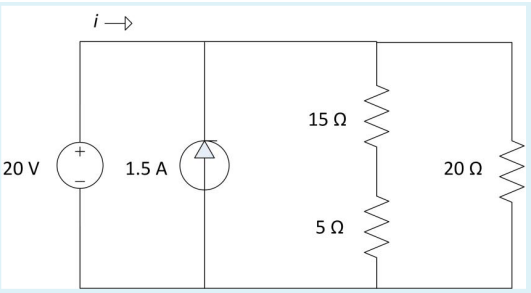


P3.06a_9ed

Find the equivalent resistance seen looking into terminals a,b.

R_{Eq} = ?? Ω (Ohms)

Answer: 64 ✔

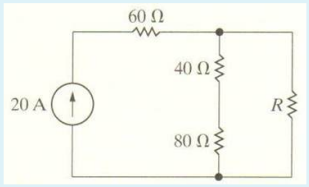


AS3.2

Find the current i in this circuit.

i = ?? Amps

Answer: 0.5 ✔



AP3.03_9ed

a) Find the value of R that will cause 4 A of current to flow through the 80 Ω resistor in the circuit.

R = 30 ✔ Ω (Ohm)

b) How much power will the resistor R from part (a) need to dissipate?

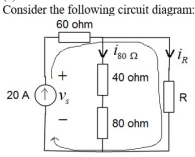
P_R = 7680 ✔ Watts

c) How much power will the current source generate for the value of R from part (a)?

P_{20A} = -33600 ✔ Watts

"-" = "delivering" and "+" = "absorbing"

(a)
Consider the following circuit diagram:



Use current division to write the expression for current through the 80 Ω resistor.

$$i_{80\Omega} = (20\ \text{A})\left(\frac{R}{R+(40+80)}\right)$$

$$4 = (20)\frac{R}{R+120} \qquad (\text{given } i_{80\Omega} = 4\ \text{A})$$

$$\frac{R}{R+120} = \frac{4}{20}$$

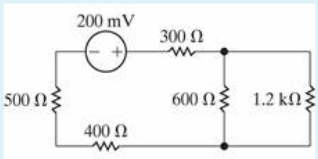
$$20R = 4(R+120)$$

$$20R - 4R = 4(120)$$

$$16R = 4(120)$$

$$R = \frac{4(120)}{16}$$

$$R = 30\ \Omega$$



P3.03c_9ed

Find the equivalent resistance seen by the 3 mA current source.

R_{Eq} = ?? Ω (Ohms)

Answer: 1600 ✔