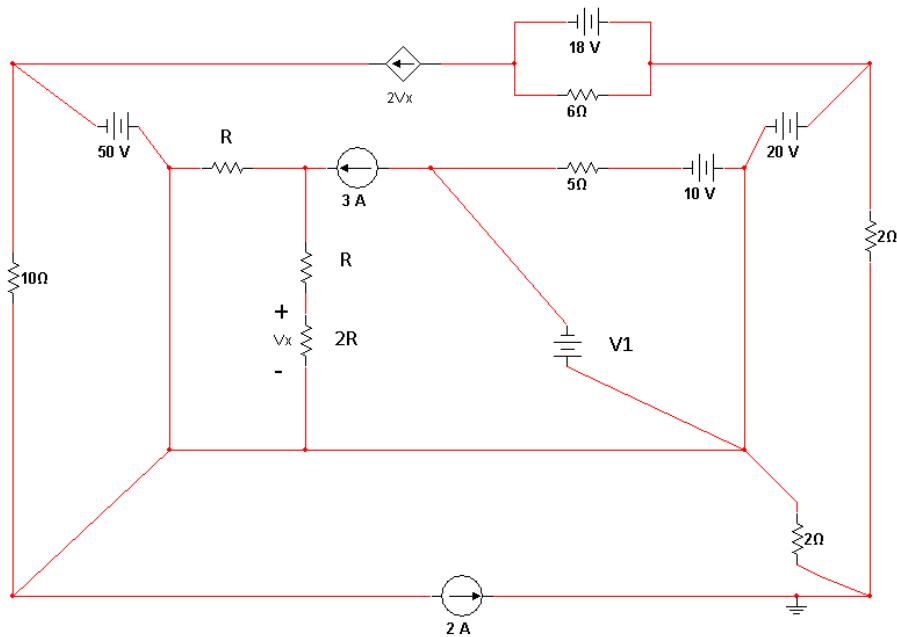
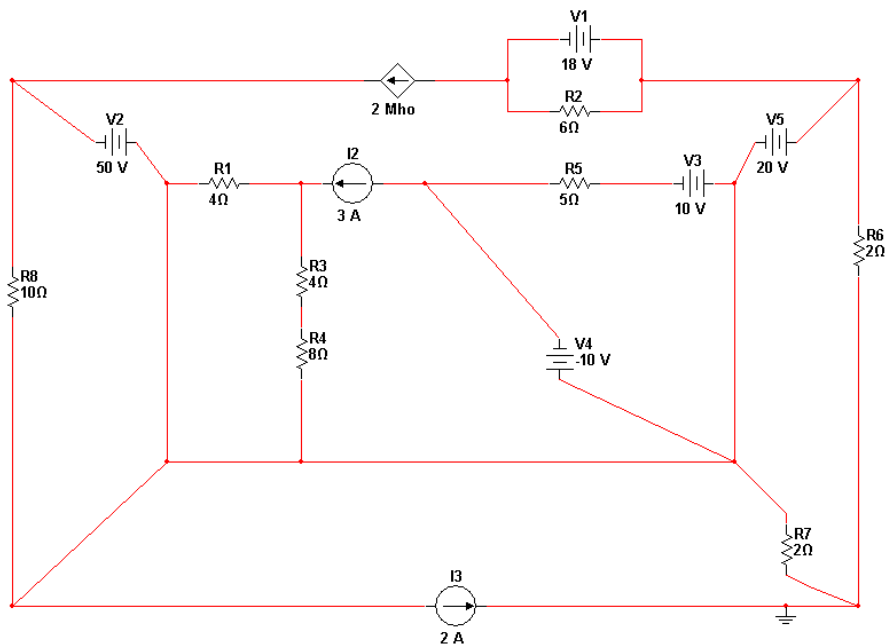


Dado el siguiente circuito calcular:



- El valor de V_1 para que la resistencia de 5 ohmios consuma una potencia de 80 vatios.
- El valor de la resistencia R que provoca que la fuente controlada $2V_x$ entregue una corriente de 12 amperios.
- La potencia en las siguientes fuentes independientes: 50 V, 18 V y 3 A. Indique claramente si suministra o consume energía.

a)



$$P = \frac{V^2}{R}$$

$$V = \sqrt{PR}$$

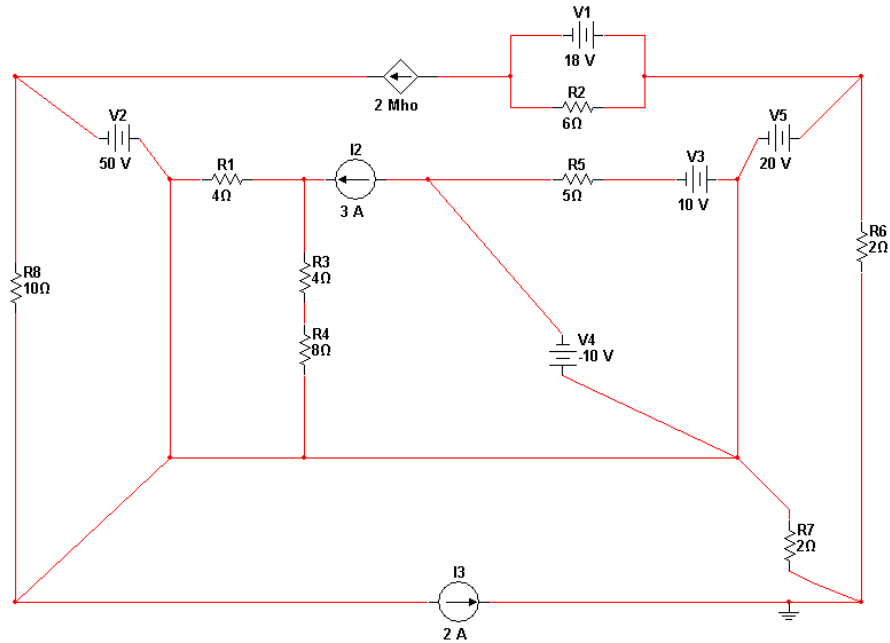
$$V = \sqrt{(80)(5)}$$

$$V = 20 \text{ V}$$

$$10 - V_1 - 20 = 0$$

$$V_1 = -10 \text{ V}$$

b)



$$3 = I_1 + I_2$$

$$V_X = I_2(2R)$$

$$\frac{3}{2}V_X = I_1R$$

$$12 = 2V_X$$

$$V_X = 6 \text{ V}$$

$$I_1 = \frac{3}{2R}(6)$$

$$I_1 = \frac{9}{R}$$

$$I_2 = \frac{V_X}{2R}$$

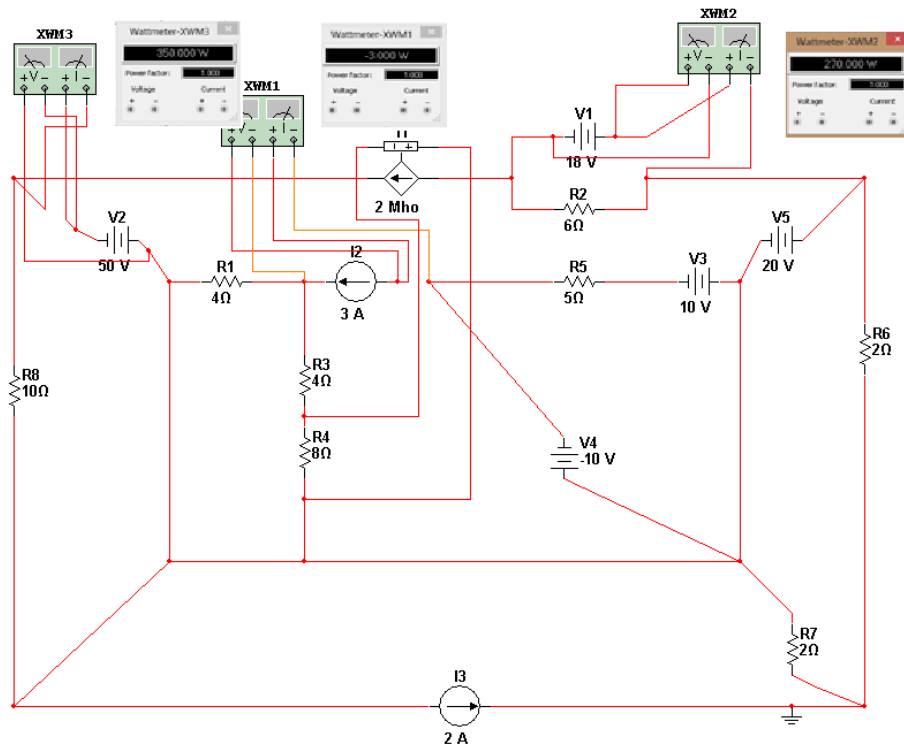
$$I_2 = \frac{3}{R}$$

$$3 = \frac{9}{R} + \frac{3}{R}$$

$$R = \frac{12}{3}$$

$$R = 4 \text{ Ohmios}$$

c)



$$50 - 10I_3 = 0$$

$$I_3 = 5 \text{ A}$$

$$I_4 = 2V_X$$

$$I_4 = 12 \text{ A}$$

$$I_5 = I_4 - I_3$$

$$I_5 = 7 \text{ A}$$

$$P_1 = 50I_5$$

$$P_1 = (50)(7)$$

$$P_1 = 350 \text{ W}, \text{ suministra energías}$$

$$12 + I_6 = I_7$$

$$I_6 = \frac{18}{6}$$

$$I_6 = 3 \text{ A}$$

$$I_6 + 12 = I_7$$

$$I_7 = 15 \text{ A}$$

$$P_2 = (18)(-15)$$

$$P_2 = -250 \text{ W}, \text{ consume energía}$$

$$V_1 + V_X + \frac{V_X}{2} - V_4 = 0$$

$$V_4 = -10 + 6 + 3$$

$$V_4 = -1 \text{ V}$$

$$P_3 = (-1)(3)$$

$$P_3 = -3 \text{ W, consume energía}$$