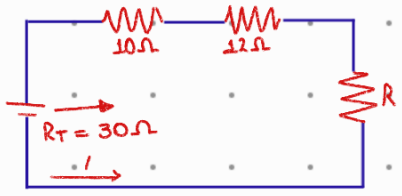
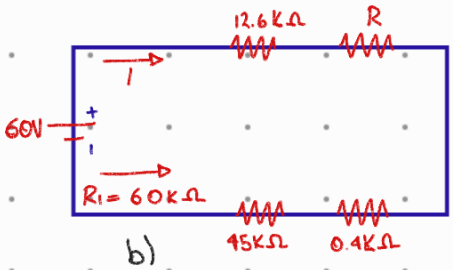
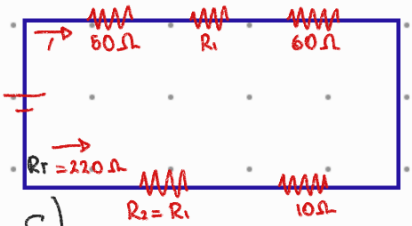
2. Se especifica la resistencia total. Encuentre las resistencias desconocidas y las corrientes / para cada circuito.



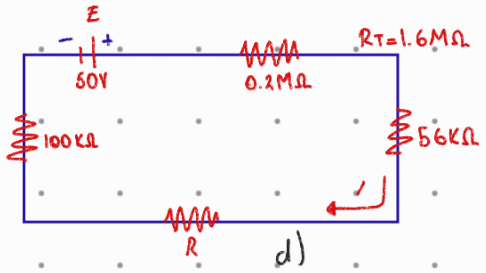
a)



b)



c)



d)

$V = I \cdot R$ (voltios)

$R = \frac{V}{I}$ (amperios)

$I = \frac{V}{R}$ (ohmnios)

Inciso a)

$V = 30V$

$R_T = 30\Omega$

$I = 1A$

$R = 8$

$R_3 = R_T - 12 - 10$

$R_3 = 30 - 12 - 10$

$R_3 = 8\Omega$

$I = \frac{V}{R_T} = \frac{30V}{30\Omega} = 1A$

Inciso c)

$I = \frac{V}{R_T} = \frac{120V}{220\Omega} = 0.54A$

$50\Omega + 60 + 2R_1 = 220\Omega$

$110 + 2R_1 = 220\Omega$

$2R_1 = \frac{220\Omega}{110\Omega}$

$2R_1 = 2$

$R_1 = 2/2$

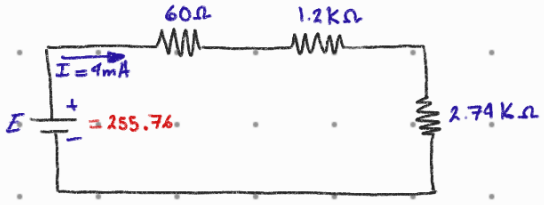
$R = 1A$

Inciso d)

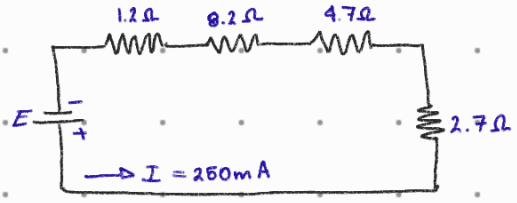
$I = \frac{V}{R_T} = \frac{60V}{1.6M\Omega} = 0.000031\Omega = 0.03M\Omega$

1,600,000

3. Encuentre el voltaje E necesario para desarrollar la corriente especificada en cada red



a)



b)

$I = 4mA \quad V = I \cdot R$

$V_{R_1} = 60\Omega \cdot 10^{-3}A = 0.06V$

$V_{R_2} = 1.2 \cdot 10^{-3} \cdot 4 \cdot 10^{-3}A = 4.8V$

$V_{R_3} = 2.74 \times 10^{3}A \cdot 4 \times 10^{-3}A$

$V_{R_3} = 10.96V$

$E = V_T = V_{R_1} + V_{R_2} + V_{R_3}$

$V_T = 15.82V$

$V_{R_1} = 1.2 \times 10^{-3}A$

$V_{R_1} = 0,0012A$

$V_{R_2} = 8.2 \times 10^{-3}A$

$= 0,0082V$

$V_{R_3} = 4.7\Omega$

$= 0,0047V$

$V_{R_4} = 2.7 \times 10^{-3}$

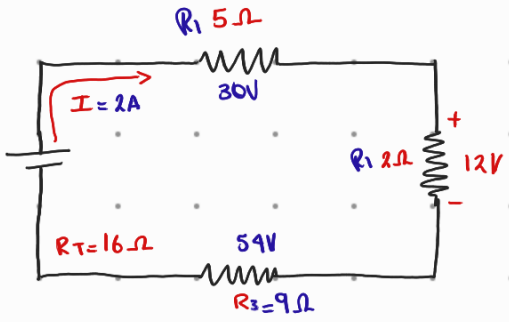
$= 0,0027V$

$E = V_T = 0,0012V + 0,0082V + 0,0047V + 0,0027V$

$= 0.0168$

$= 1.68V$

4. Para cada red de la figura. Determine la corriente I, la fuente de voltaje E, la resistencia desconocida y el voltaje en cada elemento



$R_3 = R_T - R_1 - R_2$

$R_3 = 16\Omega - 5\Omega - 2\Omega$

$R_3 = 9\Omega$

$V_{R_1} = (6A)(5\Omega)$

$= 30V$

$V_{R3} = (6A)(9\Omega)$

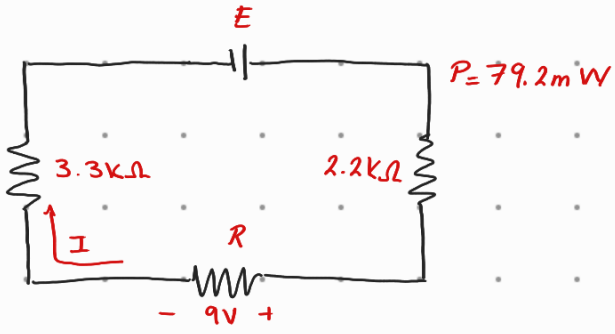
$= 54V$

$I = \frac{12V}{2\Omega} = 6A$

$E = (I)(R)$

$E = (6A)(16\Omega)$

$E = 96V$



II. Repite el problema.

$R_1 = 33\Omega\,(0.085A) = 2.8V$

$R_2 = 5.6\Omega\,(0.085A) = 0.48V$

$R_3 = 10\Omega\,(0.085A) = 0.85V$

$R_4 = 22\Omega\,(0.085A) = 1.8V$

$R_T = 22\Omega + 10\Omega + 5.6\Omega + 33\Omega$

$= 70.6\Omega$

$I_T = \frac{V}{R_T}$

$I = \frac{6V}{70.6\Omega}$

$I_T = 0.085A$

13. Ocho luces navideñas se conectan en serie

a) $R_T = N R_x\,(\Omega)$ $\quad I = \frac{V}{R_T} = \frac{120V}{225\Omega} = \frac{8}{15}A = 0.53A$

$R_T = (8)(8 + 1/8\,\Omega)$

$= 225\Omega$

b) $P_x = I^2 R_x\,(W)$

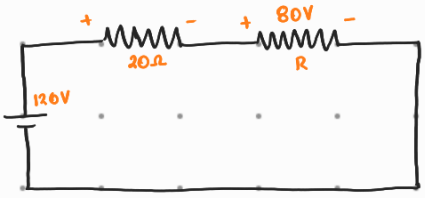
$= \left(\frac{8^2}{15}\right)(28 + \frac{1}{8}\Omega) = 8W$

c) $V_x = I R_x\,(V)$

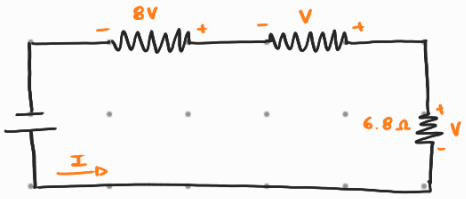
$= (8.115A \cdot 28 + 1/8\,\Omega) = 15V$

d) Cambia para un circuito abierto

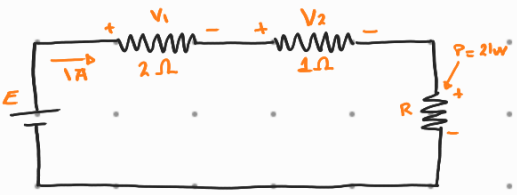
12. Encuentre las cantidades desconocidas en el circuito. Utilizando la información proporcionada



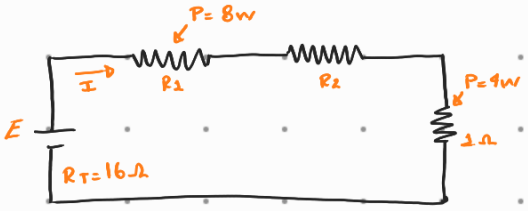
a)



b)



c)



d)

Inciso a)

$120V - 80V = 40V$

$V_? + 80V - 120V = 0$

$V_? = -80 + 120V$

$V_? = 40V$

$I = \frac{40V}{20} = 2A$

$R_? = \frac{80V}{2A} = 40\Omega$

Inciso b)

$I = \frac{8V}{6.8\Omega} = \frac{40}{11}A = 3.636A$

$V_1 = \left(\frac{40}{11}A\right)(4.7\Omega) = \frac{188V}{11} = 17.09V$

$V_2 = \left(\frac{40}{11}A\right)(6.8\Omega) = \frac{272}{11}V = 24.72V$

$E = \left(\frac{40}{11}A\right)(2.2\Omega + 4.2\Omega + 6.8\Omega)$

$= \frac{548}{11}$

$= 49.8V$

Inciso c)

$R_? = \frac{R_?}{I_2}(\Omega)$

$R_? = \frac{21W}{(1A)^2} = 21\Omega$

$V_1 = (1A)(2\Omega) = 2V$

$V_2 = (1A)(1\Omega) = 1V$

$V_3 = (1A)(21\Omega) = 21\Omega$

$E = 24V$

Inciso d)

$I = \sqrt{\frac{P}{R}}(A)$

$I = \frac{4W}{1\Omega} = 2A$

$E = (2A)(16\Omega) = 32V$

$R_? = \frac{R_?}{I_2}$

$R_? = \frac{8W}{(2A)^2} = 2\Omega$