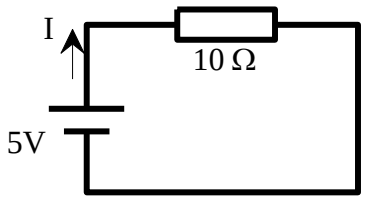
EJERCICIOS REUELTOS

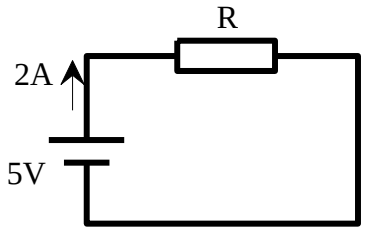
1. **Resolver los siguientes circuitos: Buscar la magnitud que desconocemos, la potencia y la energía consumida en una hora.**



$$I = \frac{V}{R} = \frac{5}{10} = 0{,}5 Amperios(A)$$

$$P = V.I = 5 \bullet 0{,}5 = 2{,}5 vatios(w)$$

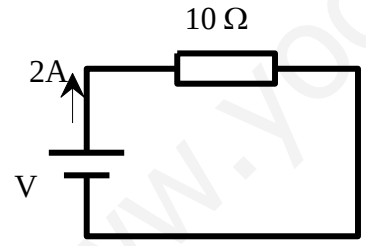
$$E = P \cdot t = 2{,}5 \bullet 1 = 2{,}5 vatios - hora =$$
$$= 0{,}0025 Kilovatios - hora(kw - h)$$



$$R = \frac{V}{I} = \frac{5}{2} = 2{,}5 \ Ohmios \ (\Omega)$$

$$P = V \bullet I = 5 \bullet 2 = 10 \ w$$

$$E = P \bullet t = 10 \bullet 1 = 0{,}010 \quad Kw - h$$

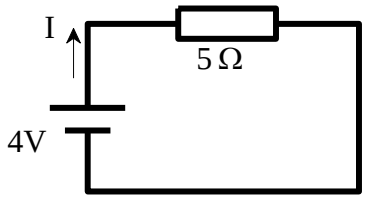


$$V = I \bullet R = 2 \bullet 10 = 20 \ Voltios \ (V)$$

$$P = V \bullet I = 20 \bullet 2 = 40 \ w$$

$$E = P \bullet t = 40 \bullet 1 = 0{,}040 \ Kw - h$$

2. Resolver el siguiente circuito aplicando la Ley de Ohm.

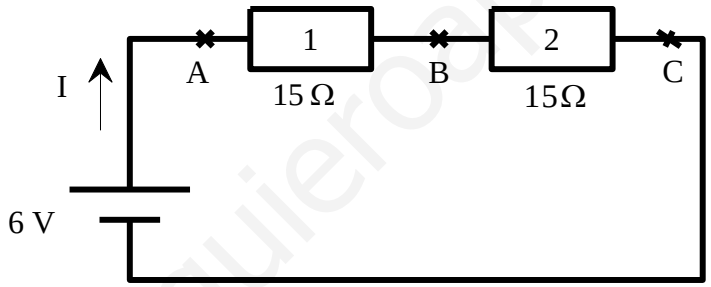


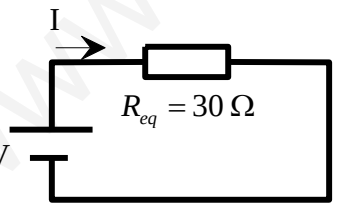
$$I = \frac{V}{R} = \frac{4}{5} = 0{,}8\ Amperios(A)$$

$$P = V.I = 4 \bullet 0{,}8 = 3{,}2\ vatios(w)$$

$$E = P \cdot t = 3{,}2 \bullet 1 = 3{,}2\ vatios - hora = 0{,}0032\ Kilovatios - hora(kw - h)$$

3. Calcular el circuito equivalente, la Intensidad, Potencia, Voltaje entre A y B, Tensión entre B y C y la Energía consumida en dos horas.





$$\boldsymbol{R_{eq} = R_1 + R_2 = 15 + 15 = 30\ \Omega}$$

$$I = \frac{V}{R_{eq}} = \frac{6}{30} = 0{,}2\ A$$

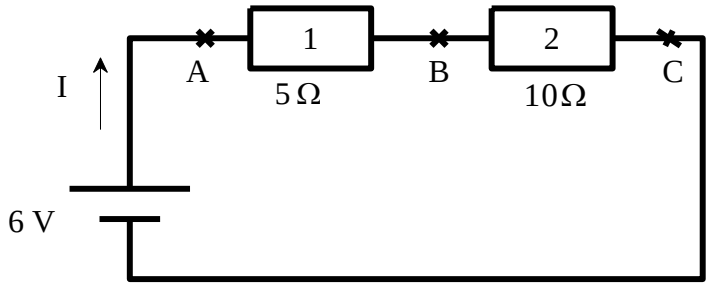
$$P = Voltaje \cdot Intensidad = 6 \cdot 0{,}2 = 1{,}2\ w$$

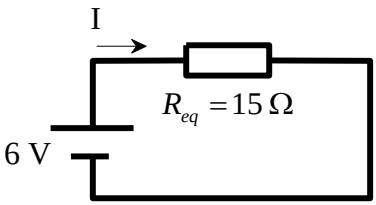
$$E = Potencia \cdot tiempo = 1{,}2 \cdot 2 = 2{,}4\ w - h = 0{,}0024\ Kw - h$$

$$V_{AB} = R_{AB} \cdot I_{AB} = 15 \cdot 0{,}2 = 3\,V$$

$$V_{BC} = R_{BC} \cdot I_{BC} = 15 \cdot 0{,}2 = 3\,V$$

4. Calcular el circuito equivalente, la Intensidad, Potencia, Voltaje entre A y B, Tensión entre B y C y la Energía consumida en dos horas.





$$R_{eq} = R_1 + R_2 = 5 + 10 = 15\,\Omega$$

$$I = \frac{V}{R_{eq}} = \frac{6}{15} = 0{,}4\ A$$

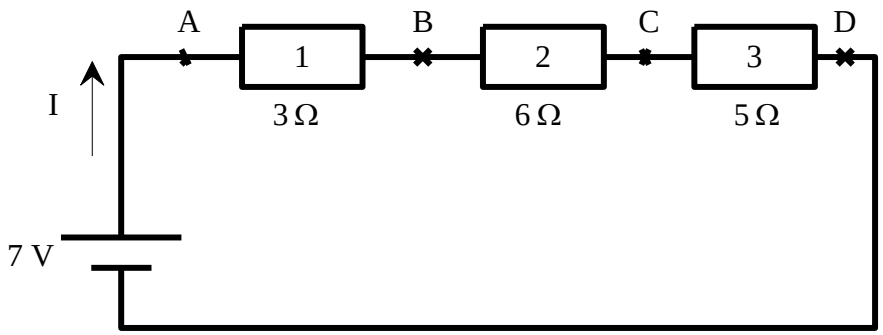
$$P = V \cdot I = 6 \cdot 0{,}4 = 2{,}4\ w$$

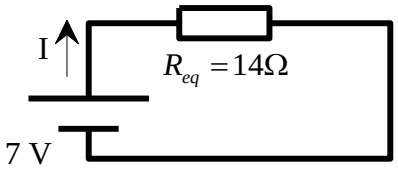
$$E = P \cdot t = 2{,}4 \cdot 2 = 4{,}8\ w-h = 0{,}0048\ Kw-h$$

$$V_{AB} = R_{AB} \cdot I_{AB} = 5 \cdot 0{,}4 = 2\,V$$

$$V_{BC} = R_{BC} \cdot I_{BC} = 10 \cdot 0{,}4 = 4\,V$$

5. Calcular el circuito equivalente, la Intensidad, Potencia, Voltaje entre A y B, B y C y C y D, y la Energía consumida en tres horas.





$R_{eq} = R_1 + R_2 + R_3 = 3 + 6 + 5 = 14\ \Omega$

$I = \dfrac{V}{R_{eq}} = \dfrac{7}{14} = 0{,}5\ A$

$P = V \cdot I = 7 \cdot 0{,}5 = 3{,}5\ w$

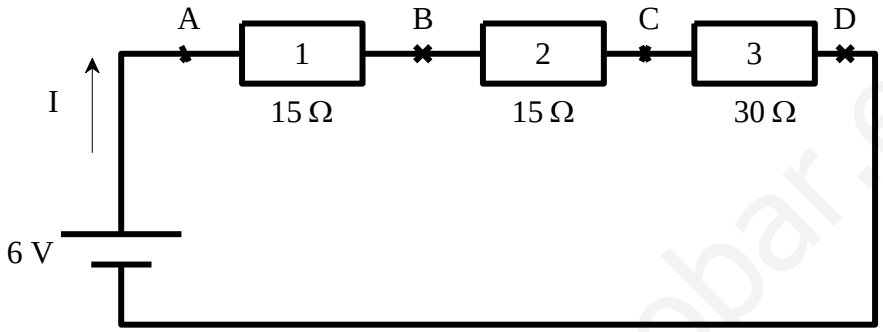
$E = P \cdot t = 3{,}5 \cdot 3 = 10{,}5\ w-h == 0{,}0105\ Kw-h$

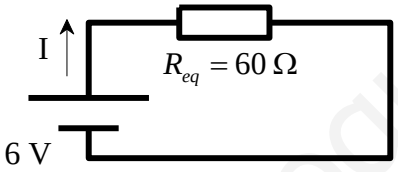
$V_{AB} = R_{AB} \cdot I_{AB} = 3 \cdot 0{,}5 = 1{,}5\ V$

$V_{BC} = R_{BC} \cdot I_{BC} = 6 \cdot 0{,}5 = 3\ V$

$V_{CD} = R_{CD} \cdot I_{BC} = 5 \cdot 0{,}5 = 2{,}5\ V$

6. Calcular el circuito equivalente, la Intensidad, Potencia, Voltaje entre A y B, B y C y C y D, y la Energía consumida en tres horas.





$$R_{eq} = R_1 + R_2 + R_3 = 15 + 15 + 30 = 60\ \Omega$$

$$I = \frac{V}{R_{eq}} = \frac{6}{60} = 0{,}1\ A$$

$$P = V \cdot I = 6 \cdot 0{,}1 = 0{,}6\ w$$

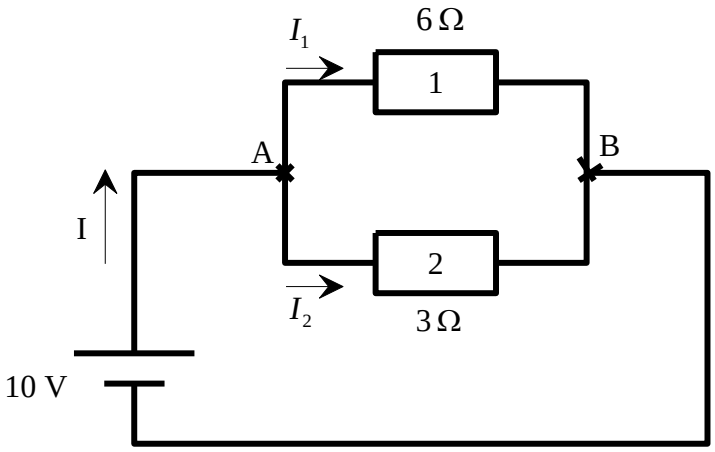
$$E = P \cdot t = 0{,}6 \cdot 3 = 1{,}8\ w-h == 0{,}0018\ Kw-h$$

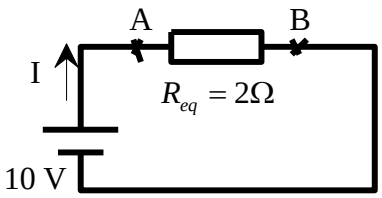
$$V_{AB} = R_{AB} \cdot I_{AB} = 15 \cdot 0{,}1 = 1{,}5\ V$$

$$V_{BC} = R_{BC} \cdot I_{BC} = 15 \cdot 0{,}1 = 1{,}5\ V$$

$$V_{CD} = R_{CD} \cdot I_{BC} = 30 \cdot 0{,}1 = 3\ V$$

7. Calcular el circuito equivalente, la Intensidad I, las Intensidades I_1 y I_2, Potencia del circuito y la Energía consumida en 2 horas y media.





$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{6} + \frac{1}{3} = \frac{3+6}{6 \cdot 3} = \frac{9}{18}$$

$$R_{eq} = \frac{18}{9} = 2\ \Omega$$

$$I = \frac{V}{R_{eq}} = \frac{10}{2} = 5\ A$$

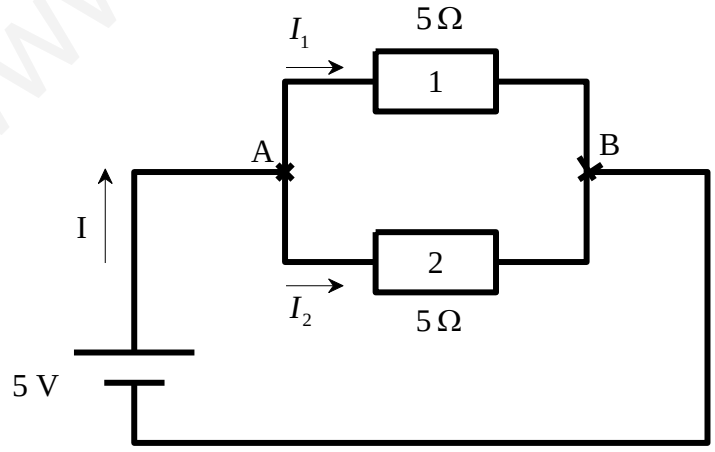
$$P = V \cdot I = 10 \cdot 5 = 50\ w$$

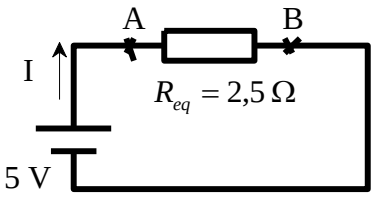
$$E = P \cdot t = 50 \cdot 2{,}5 = 125\ w\text{–}h = 0{,}125\ kw\text{–}h$$

$$I_1 = \frac{V_{AB}}{R_1} = \frac{10}{6} = 1{,}67\ A$$

$$I_2 = \frac{V_{AB}}{R_2} = \frac{10}{3} = 3{,}33\ A$$

8. Calcular el circuito equivalente, la Intensidad I, las Intensidades I_1 y I_2, Potencia del circuito y la Energía consumida en 2 horas y media.





$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{5} + \frac{1}{5} = \frac{5+5}{5\cdot 5} = \frac{10}{25}$$

$$R_{eq} = \frac{25}{10} = 2{,}5\ \Omega$$

$$I = \frac{V}{R_{eq}} = \frac{5}{2{,}5} = 2\ A$$

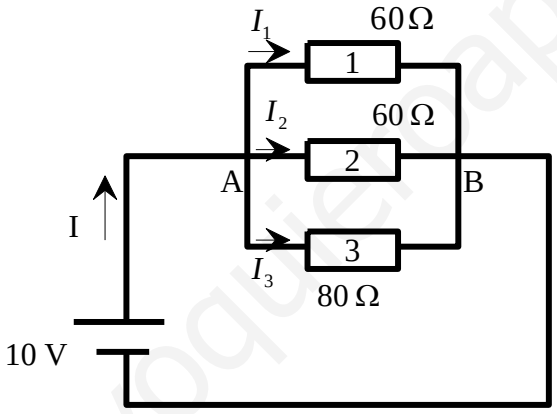
$$P = V \cdot I = 5 \cdot 2 = 10\ w$$

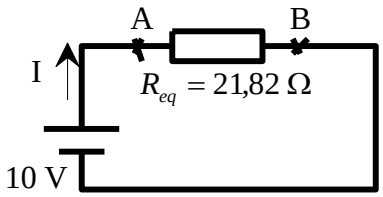
$$E = P \cdot t = 10 \cdot 2{,}5 = 25\ w\text{–}h = 0{,}025\ kw\text{–}h$$

$$I_1 = \frac{V_{AB}}{R_1} = \frac{10}{6} = 1{,}67\ A$$

$$I_2 = \frac{V_{AB}}{R_2} = \frac{10}{3} = 3{,}33\ A$$

9. Calcular el circuito equivalente, las Intensidades I, I_1, I_2 y I_3, Potencia del circuito y Energía consumida en 3 horas.





$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} = \frac{R_2 \cdot R_3 + R_1 \cdot R_3 + R_1 \cdot R_2}{R_1 \cdot R_2 \cdot R_3}$$

$$\frac{1}{R_{eq}} = \frac{60 \cdot 80 + 60 \cdot 80 + 60 \cdot 60}{60 \cdot 60 \cdot 80} = \frac{13200}{288000}$$

$$R_{eq} = \frac{288000}{13200} = 21{,}82\ \Omega$$

$$I = \frac{V}{R_{eq}} = \frac{10}{21{,}82} = 0{,}46\ A$$

$$I_1 = \frac{V_{AB}}{R_1} = \frac{10}{60} = 0{,}17\ A$$

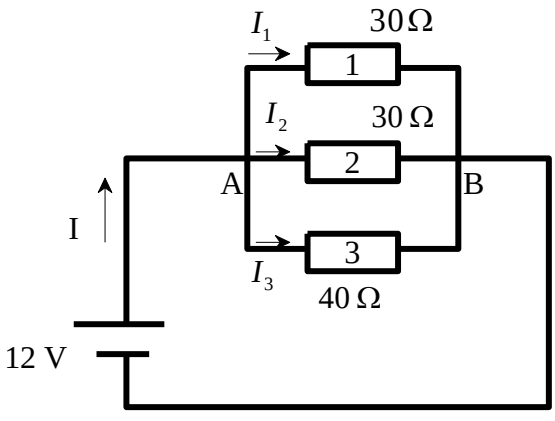
$$I_2 = \frac{V_{AB}}{R_2} = \frac{10}{60} = 0{,}17\ A$$

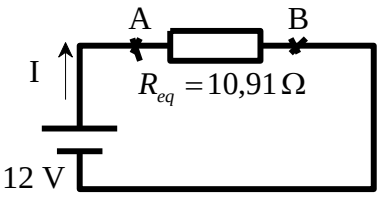
$$I_3 = \frac{V_{AB}}{R_3} = \frac{10}{80} = 0{,}12\ A$$

$$P = V \cdot I = 10.0{,}46 = 4{,}6\ w$$

$$E = P \cdot t = 4{,}6 \cdot 3 = 13{,}8\ w\text{–}h = 0{,}0138\ Kw\text{–}h$$

10. Calcular el circuito equivalente, las Intensidades I, I_1, I_2 y I_3, Potencia del circuito y Energía consumida en 3 horas.





$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} = \frac{R_2 \cdot R_3 + R_1 \cdot R_3 + R_1 \cdot R_2}{R_1 \cdot R_2 \cdot R_3}$$

$$\frac{1}{R_{eq}} = \frac{30 \cdot 40 + 30 \cdot 40 + 30 \cdot 30}{30 \cdot 30 \cdot 40} = \frac{3300}{36000}$$

$$R_{eq} = \frac{36000}{3300} = 10{,}91\,\Omega$$

$$I = \frac{V}{R_{eq}} = \frac{12}{10{,}91} = 1{,}10\ A$$

$$I_1 = \frac{V_{AB}}{R_1} = \frac{12}{30} = 0{,}4\ A$$

$$I_2 = \frac{V_{AB}}{R_2} = \frac{12}{30} = 0{,}4\ A$$

$$I_3 = \frac{V_{AB}}{R_3} = \frac{12}{40} = 0{,}3\ A$$

$$P = V \cdot I = 12.1{,}10 = 13{,}20\ w$$

$$E = P \cdot t = 13{,}20 \cdot 3 = 39{,}6\ w\text{–}h = 0{,}0396\ Kw\text{–}h$$

11. Calcular en el siguiente circuito la intensidad y la potencia de la bombilla.