

# Ejercicios

## Ejercicio 1

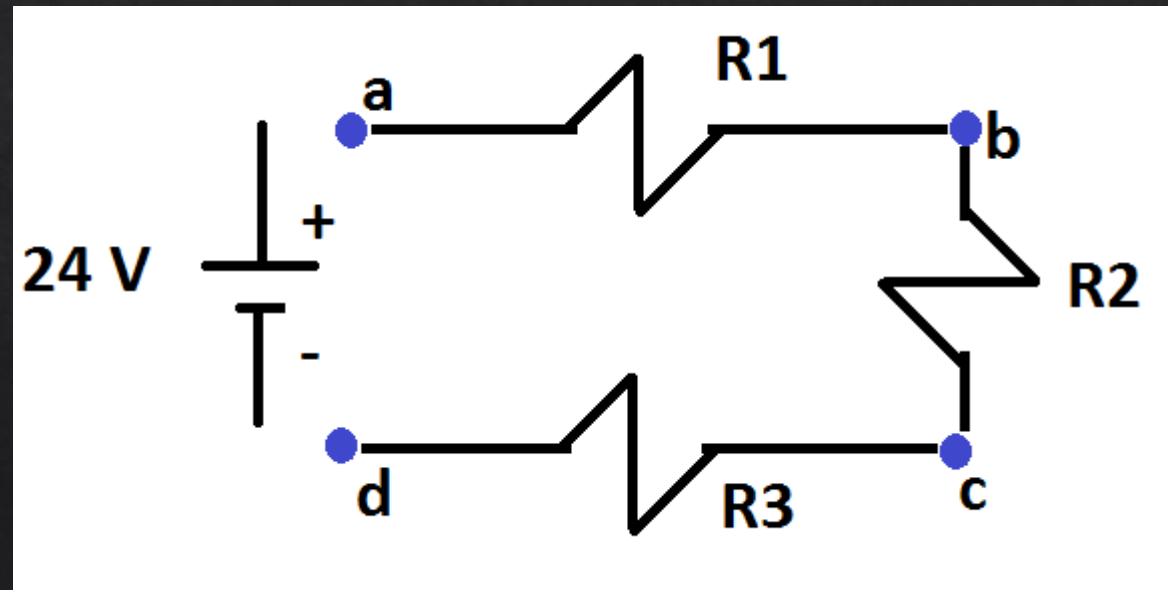
Para la conexión de resistores mostrada obtenga:

a) El resistor equivalente entre los puntos a y d

$$R1 = 14 \text{ ohm}$$

$$R2 = 6 \text{ ohm}$$

$$R3 = 20 \text{ ohm}$$



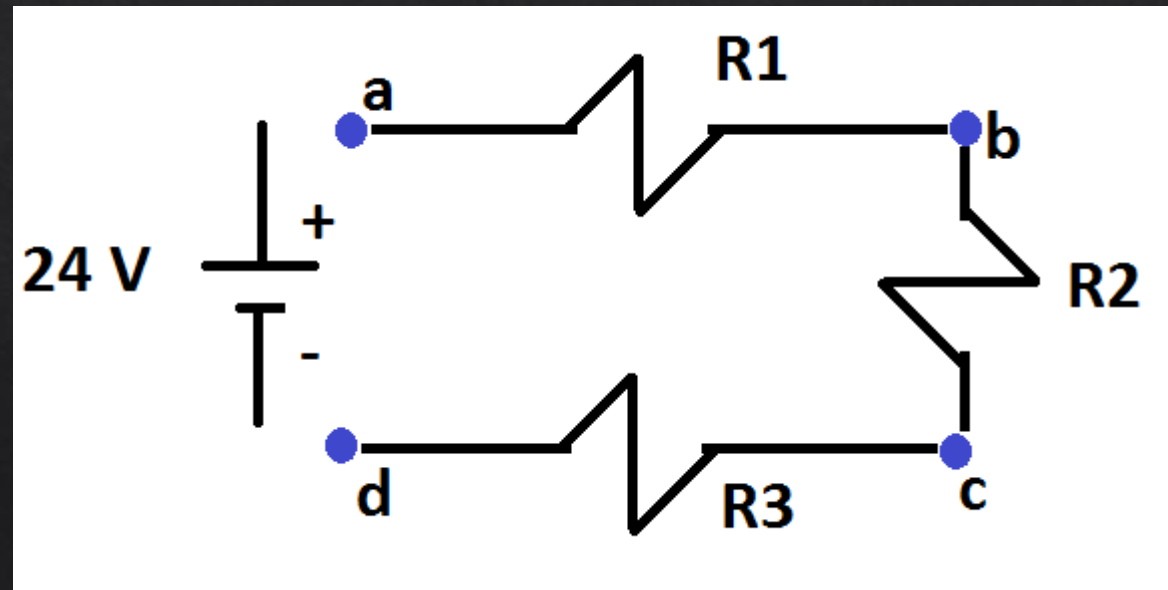
a) El resistor equivalente entre los puntos a y d

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

$$R_1 = 14 \text{ ohm}$$

$$R_2 = 6 \text{ ohm}$$

$$R_3 = 20 \text{ ohm}$$



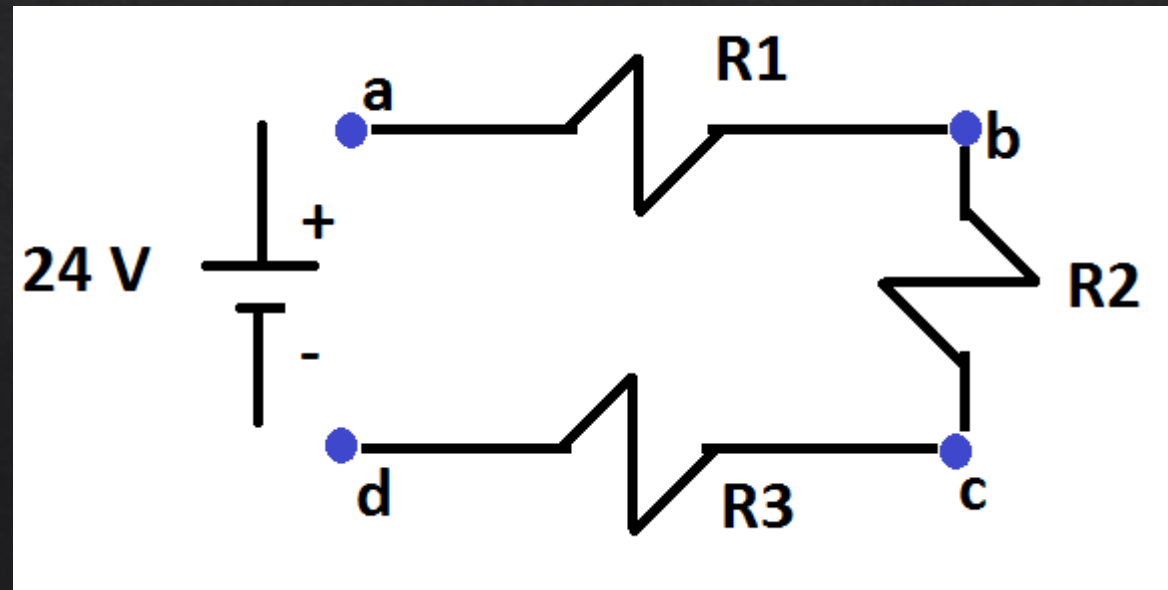
a) El resistor equivalente entre los puntos a y d

$$R_{eq} = 14 + 6 + 20 = 40 \text{ (ohm)}$$

$$R1 = 14 \text{ ohm}$$

$$R2 = 6 \text{ ohm}$$

$$R3 = 20 \text{ ohm}$$



b) La corriente eléctrica en cada resistor si la  $V_{ad}$  es de 24 volts.

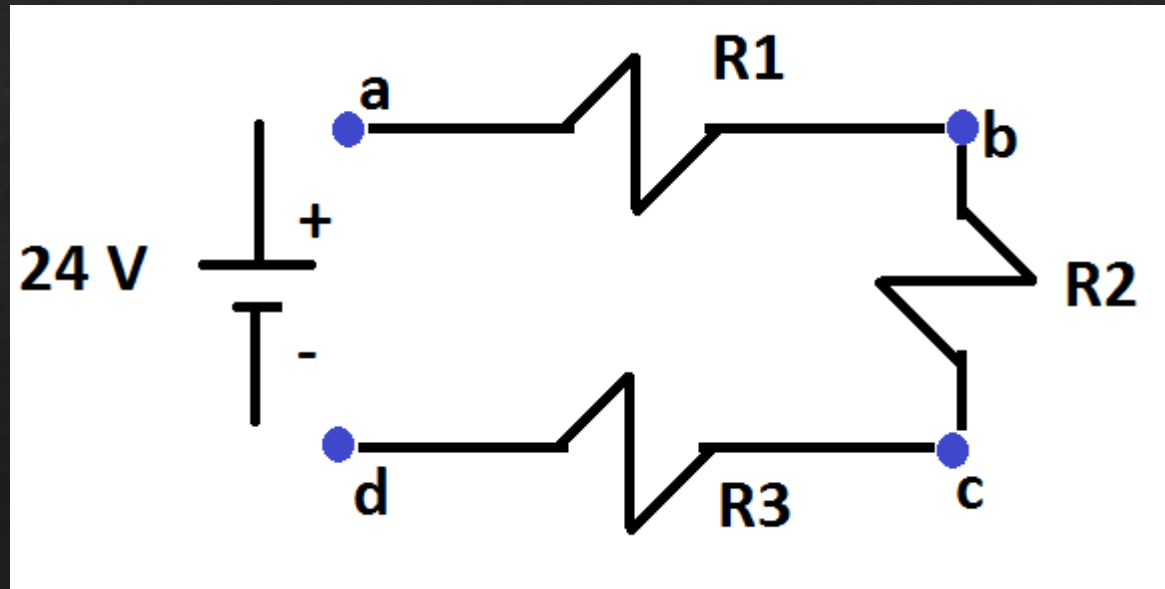
$$V_{ad} = R_{eq} * I$$

$$I = \frac{V_{ad}}{R_{eq}}$$

$$R1 = 14 \text{ ohm}$$

$$R2 = 6 \text{ ohm}$$

$$R3 = 20 \text{ ohm}$$



b) La corriente eléctrica en cada resistor si la  $V_{ad}$  es de 24 volts.

$$I = \frac{V_{ad}}{R_{eq}}$$

$$I = \frac{24}{40}$$

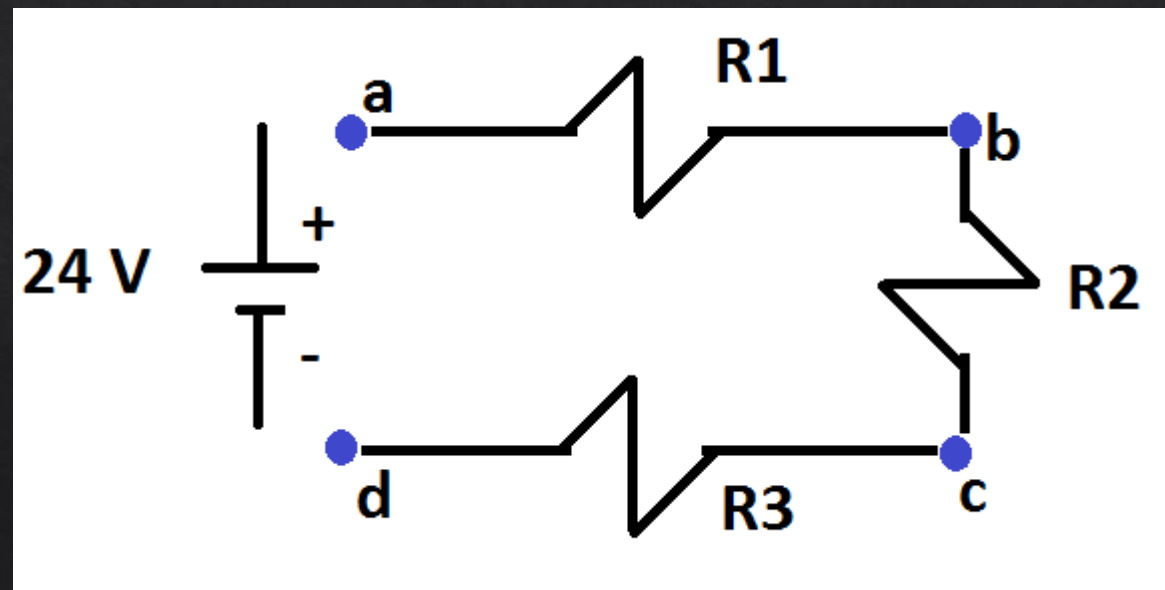
$$I = 0.6 \text{ A}$$

$$I = I_1 = I_2 = I_3 = 0.6 \text{ A}$$

$$R1 = 14 \text{ ohm}$$

$$R2 = 6 \text{ ohm}$$

$$R3 = 20 \text{ ohm}$$





c) La diferencia de potencial entre los extremos de cada resistor.

$$V_{ab} = R_1 * I_1$$

$$V_{ab} = 14 * 0.6 = 8.4 \text{ volts}$$

$$V_{bc} = R_2 * I_2$$

$$V_{bc} = 6 * 0.6 = 3.6 \text{ volts}$$

$$V_{cd} = R_3 * I_3$$

$$V_{cd} = 20 * 0.6 = 12.0 \text{ volts}$$

$$R1 = 14 \text{ ohm}$$

$$R2 = 6 \text{ ohm}$$

$$R3 = 20 \text{ ohm}$$

$$V_{ad} = 8.4 + 3.6 + 12.0 = 24.0 \text{ volts}$$

d) La potencia eléctrica en cada resistor.

$$P_{ab} = V_1 * I_1$$

$$P_{ab} = 8.4 * 0.6 = 5.04 \text{ watts}$$

$$P_{bc} = V_2 * I_2$$

$$P_{bc} = 3.6 * 0.6 = 21.6 \text{ watts}$$

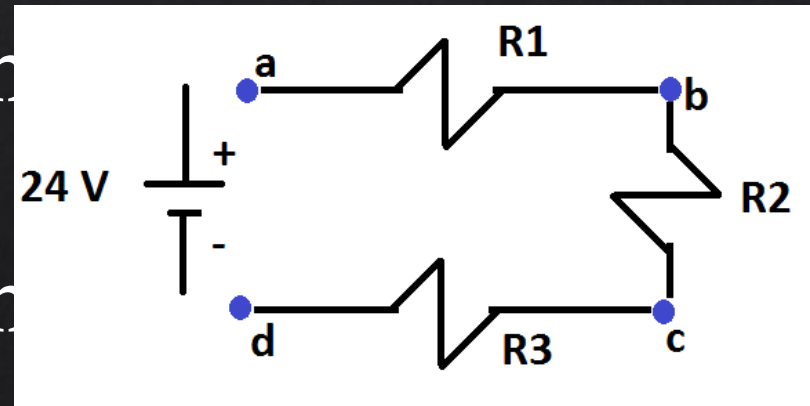
$$P_{cd} = V_3 * I_3$$

$$P_{cd} = 12 * 0.6 = 7.2 \text{ watts}$$

$$R1 = 14 \text{ ohm}$$

$$R2 = 6 \text{ ohm}$$

$$R3 = 20 \text{ ohm}$$





e) La energía que disipa cada resistor durante 3 minutos

$$E_{ab} = P_1 * t$$

$$E_{ab} = 5.04 * 180 = 907.2 \text{ Joule}$$

$$E_{bc} = P_2 * t$$

$$E_{bc} = 21.6 * 180 \text{ s} = 388.8 \text{ Joule}$$

$$E_{cd} = P_3 * t$$

$$E_{cd} = 7.2 * 180 = 1296 \text{ Joule}$$

## Ejercicio 2

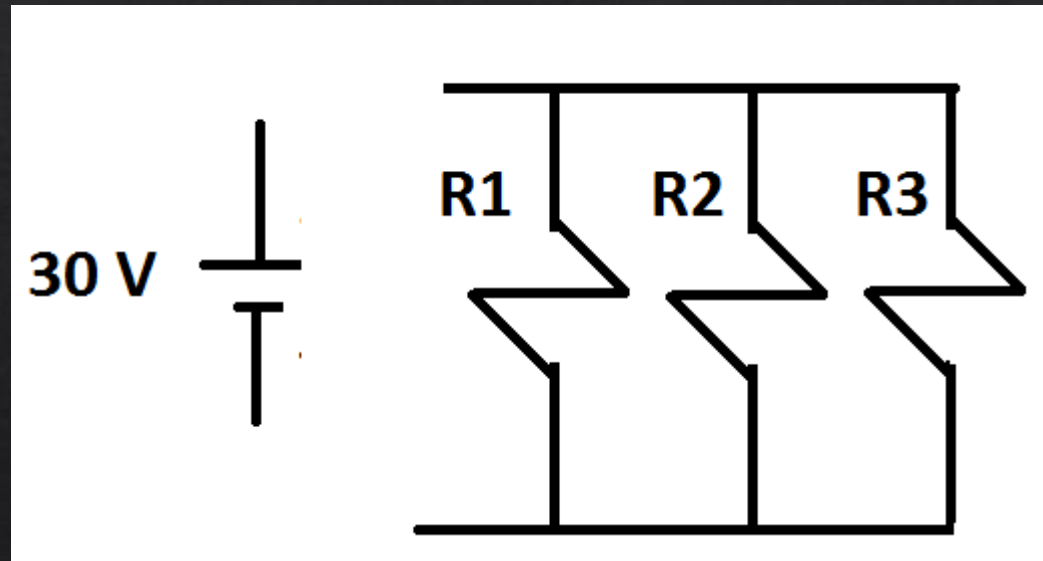
Para la conexión de resistores mostrada obtenga:

a) El resistor equivalente entre los puntos a y d

$$R1 = 12 \text{ ohm}$$

$$R2 = 6 \text{ ohm}$$

$$R3 = 4 \text{ ohm}$$



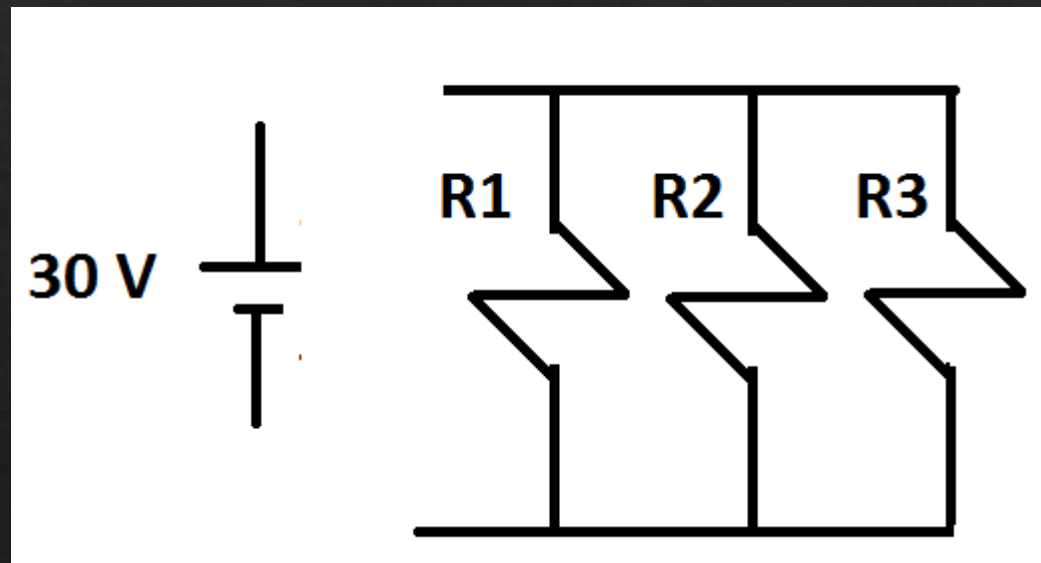
a) El resistor equivalente entre los puntos a y d

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

$$R_1 = 14 \text{ ohm}$$

$$R_2 = 6 \text{ ohm}$$

$$R_3 = 20 \text{ ohm}$$



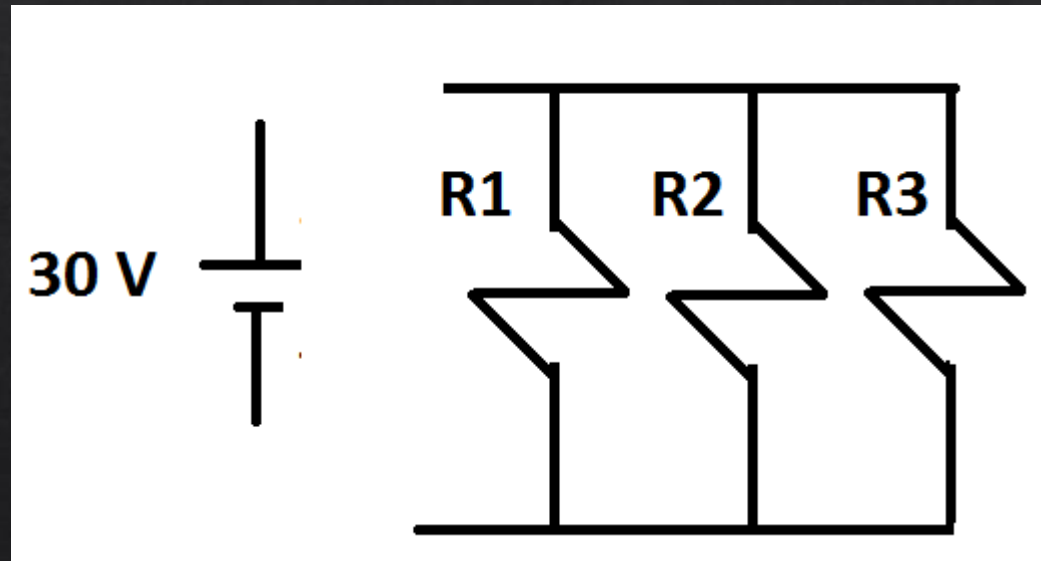
b) La diferencia de potencial para cada resistor

$$V_{ab} = V_{R_1} = V_{R_2} = V_{R_3}$$

$$R_1 = 14 \text{ ohm}$$

$$R_2 = 6 \text{ ohm}$$

$$R_3 = 20 \text{ ohm}$$



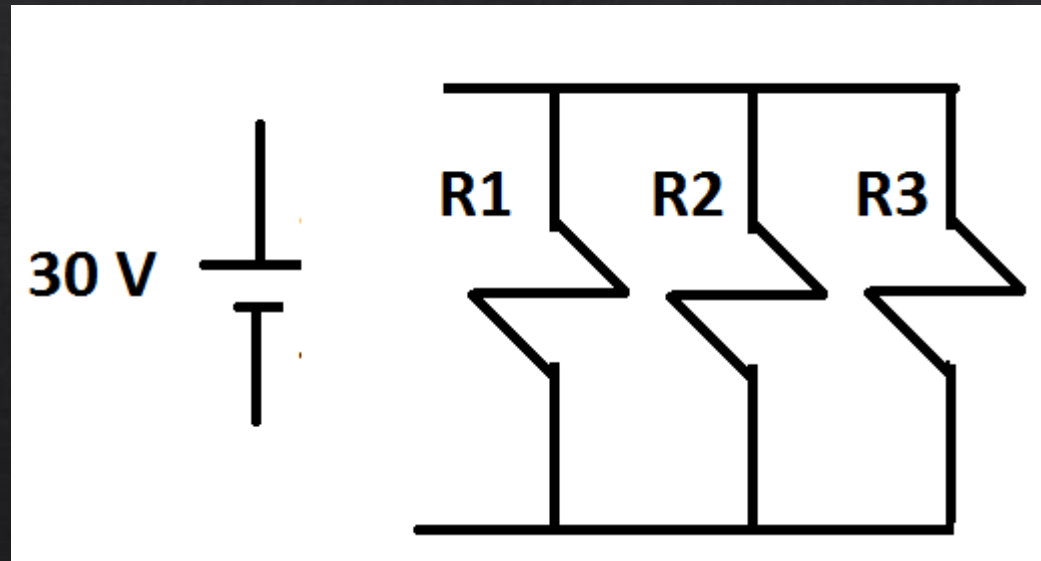
c) La corriente eléctrica para cada resistor

$$V_{ab} = V_{R_1} = V_{R_2} = V_{R_3}$$

$$R_1 = 14 \text{ ohm}$$

$$R_2 = 6 \text{ ohm}$$

$$R_3 = 20 \text{ ohm}$$



- a)  $R_{ab} = 2 \text{ ohm}$
- b)  $V_{ab} = 30 \text{ volts}$
- c)  $I_1 = 2.5 \text{ A}$
- d)  $I_2 = 5 \text{ A}$
- e)  $I_3 = 7.5 \text{ A}$
  
- f)  $I_{ab} = 15 \text{ A}$
- g)  $P_1 = 75 \text{ watt}$
- h)  $P_2 = 150 \text{ watt}$
- i)  $P_3 = 225 \text{ watt}$
  
- j)  $E_1 = 9000$
- k)  $E_2 = 18000$
- l)  $E_3 = 27000$

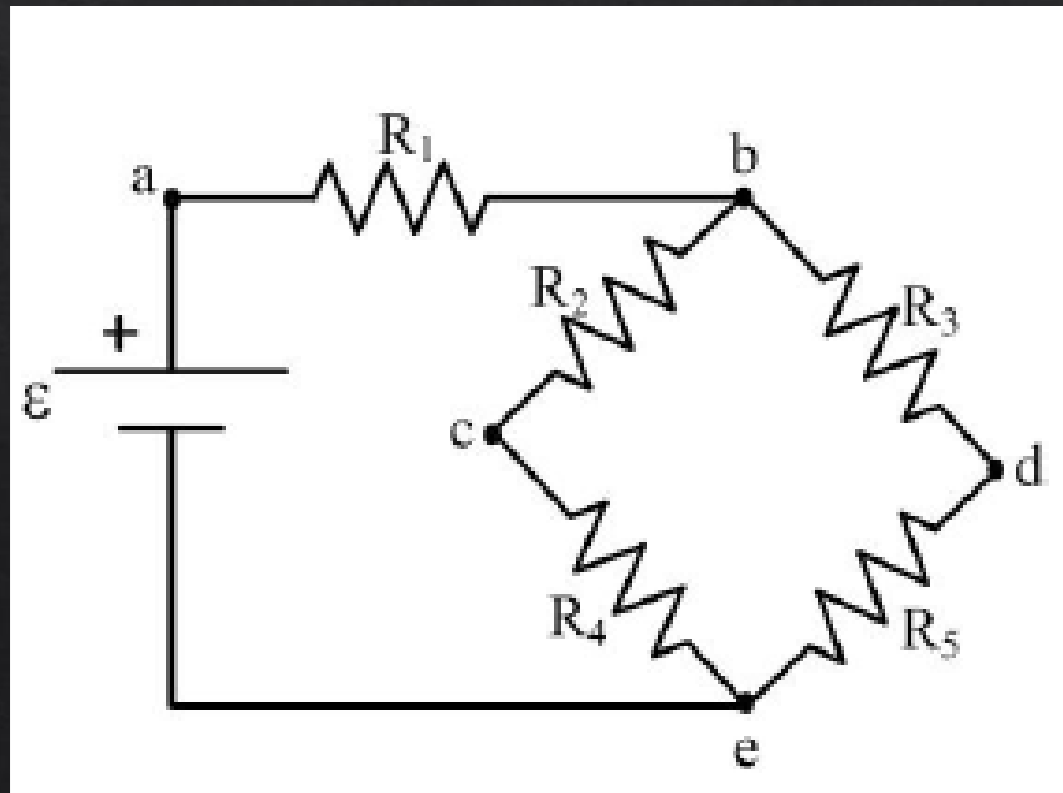


# Ejercicio 1

Para la conexión de resistores, determine :

- La resistencia equivalente
- La corriente eléctrica que entrega la fuente

$$\begin{aligned}\varepsilon &= 7.5 \text{ [V]} \\ R_1 &= 25 \text{ [\Omega]} \\ R_2 &= 70 \text{ [\Omega]} \\ R_3 &= 20 \text{ [\Omega]} \\ R_4 &= 30 \text{ [\Omega]} \\ R_5 &= 80 \text{ [\Omega]}\end{aligned}$$



## a) La resistencia equivalente

$$\varepsilon = 7.5 \text{ [V]}$$

$$R_1 = 25 \text{ [\Omega]}$$

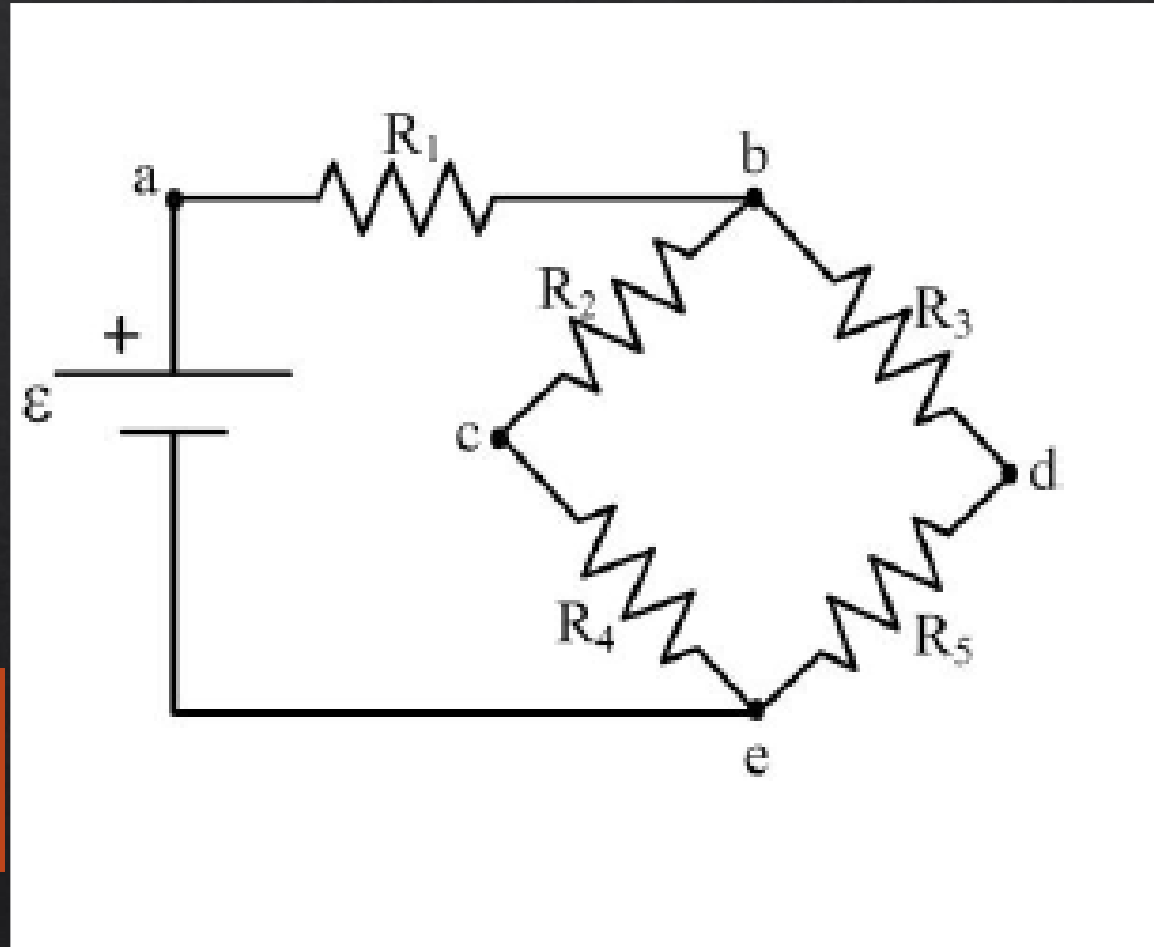
$$R_2 = 70 \text{ [\Omega]}$$

$$R_3 = 20 \text{ [\Omega]}$$

$$R_4 = 30 \text{ [\Omega]}$$

$$R_5 = 80 \text{ [\Omega]}$$

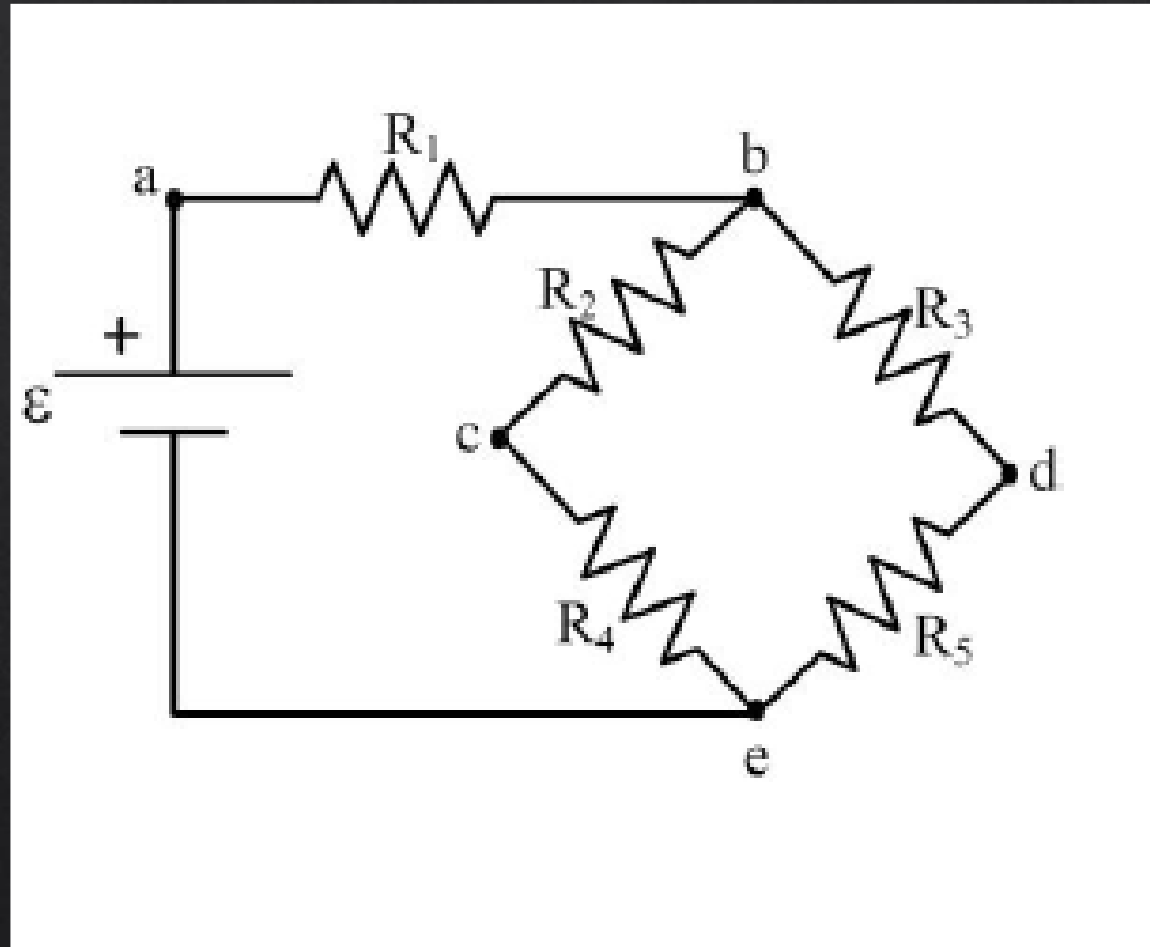
$$R_{eq} = 75 \text{ \Omega}$$



b) La corriente eléctrica que entrega la fuente

$$\begin{aligned}\varepsilon &= 7.5 \text{ [V]} \\ R_1 &= 25 \text{ [\Omega]} \\ R_2 &= 70 \text{ [\Omega]} \\ R_3 &= 20 \text{ [\Omega]} \\ R_4 &= 30 \text{ [\Omega]} \\ R_5 &= 80 \text{ [\Omega]}\end{aligned}$$

$$I_{eq} = 0.1 \text{ A}$$



# Bibliografía

Electricidad y Magnetismo

Gabriel Jaramillo

Editorial Trillas

Ejercicios tomados de exámenes colegiados del Departamento de Física  
Experimental

CEDECO

CURSO VIRTUAL

"ELECTRICISTA INDUSTRIAL"

REALIZACIÓN:



**CENTRO LOGÍSTICO VIRTUAL**

**CLV**