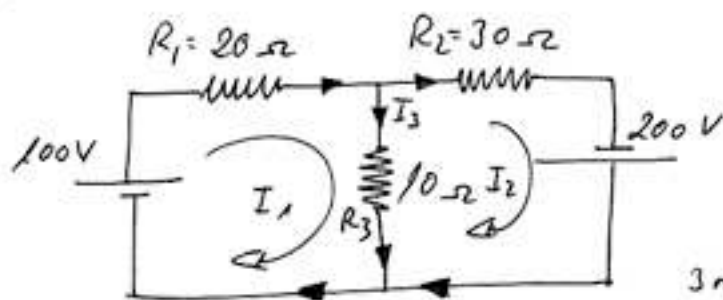


Calcular las I que circulan por cada rama.



3 ramas - (2 nodos - 1) = 2 ecuaciones independientes

Método de las mallas.

$$\begin{cases} 100 = (20+10)I_1 - 10I_2 \\ 200 = -10I_1 + (30+10)I_2 \end{cases} \Rightarrow \begin{cases} 30I_1 - 10I_2 = 100 \\ -10I_1 + 40I_2 = 200 \end{cases}$$

$$\begin{pmatrix} 30 & -10 \\ -10 & 40 \end{pmatrix} \begin{pmatrix} I_1 \\ I_2 \end{pmatrix} = \begin{pmatrix} 100 \\ 200 \end{pmatrix}$$

$$I_1 = \frac{\begin{vmatrix} 100 & -10 \\ 200 & 40 \end{vmatrix}}{\begin{vmatrix} 30 & -10 \\ -10 & 40 \end{vmatrix}} = \frac{4000 - (-2000)}{1200 - (100)} = \frac{6000}{1100} = \underline{\underline{5'45 \text{ A}}}$$

$$I_2 = \frac{\begin{vmatrix} 30 & 100 \\ -10 & 200 \end{vmatrix}}{\begin{vmatrix} 30 & -10 \\ -10 & 40 \end{vmatrix}} = \frac{6000 - (-1000)}{1100} = \frac{7000}{1100} = \underline{\underline{6'36 \text{ A}}}$$

$$I_3 + I_2 = I_1$$

$$I_3 = I_1 - I_2 = 5'45 - 6'36 = \underline{\underline{-0'91}}$$

V en cada componente

Potencias consumidas

Potencia generada

$$V_{R_1} = R_1 \cdot I_1 = 20 \cdot 5'45 = 109 \text{ V}$$

$$P_1 = V_{R_1} \cdot I_1 = 109 \cdot 5'45 = 594 \text{ W}$$

$$P_{100} = 100 \cdot 5'45 = 545 \text{ W}$$

$$V_{R_2} = R_2 \cdot I_2 = 30 \cdot 6'36 = 190'8 \text{ V}$$

$$P_2 = V_{R_2} \cdot I_2 = 190'8 \cdot 6'36 = 1213'4 \text{ W}$$

$$P_{200} = 200 \cdot 6'36 = 1272 \text{ W}$$

$$V_{R_3} = R_3 \cdot I_3 = 10 \cdot (-0'91) = -9'1 \text{ V}$$

$$P_3 = V_{R_3} \cdot I_3 = 9'1 \cdot 0'91 = 8'28 \text{ W}$$

$$P_T = P_{100} + P_{200} = 1817 \text{ W}$$

$$P_T = P_1 + P_2 + P_3 = 1815'7 \text{ W}$$