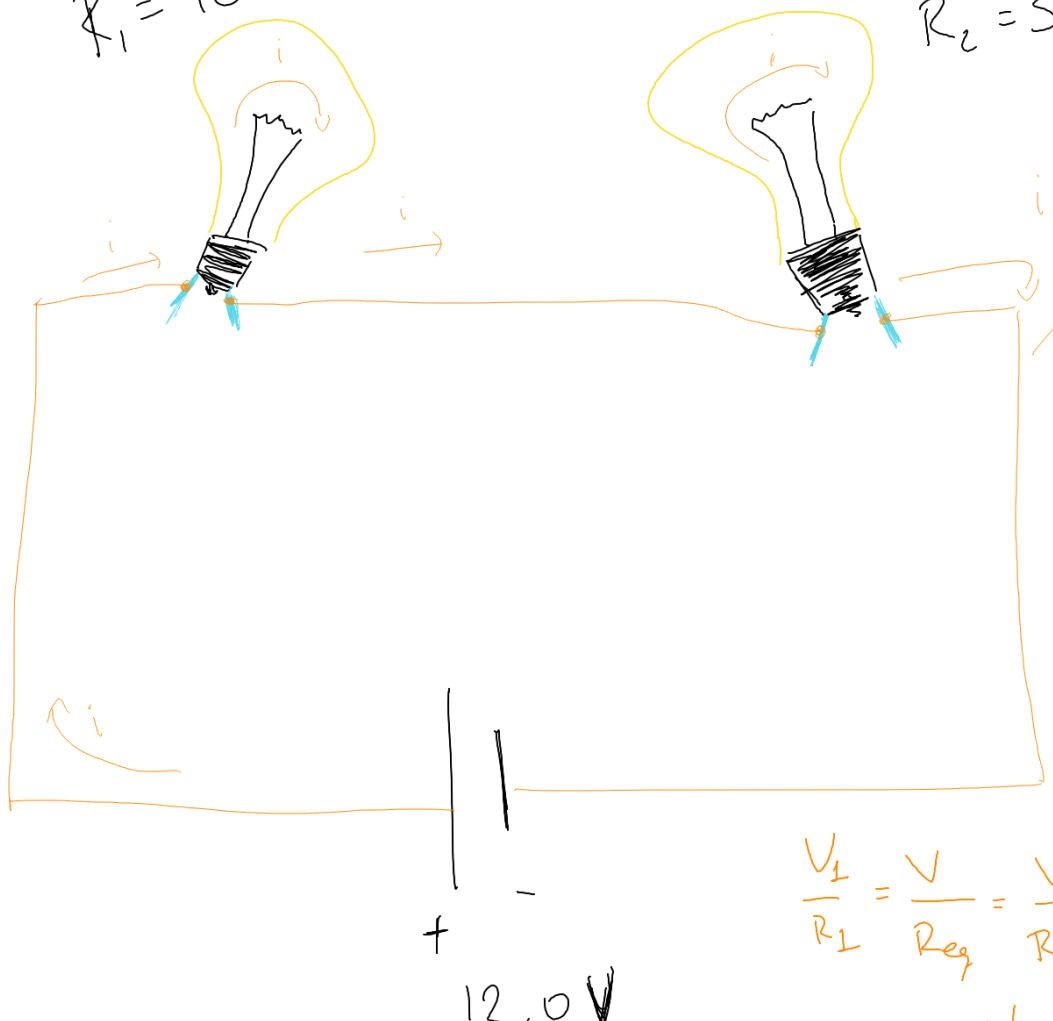
2.1.11) $R_1 = 100\ \Omega$ $R_2 = 50,0\ \Omega$ $P = V i = R i^2 = \frac{V^2}{R}$



en serie

$i = \frac{V}{R}$

$R_{eq} = R_1 + R_2$

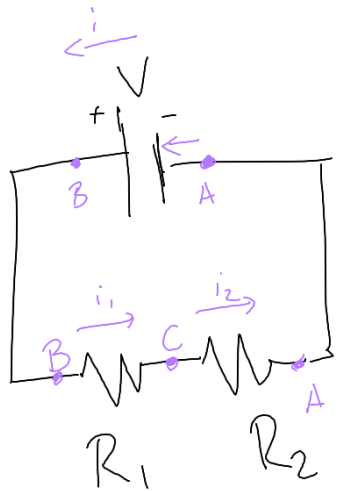
$i_1 = i_2 = i_3$

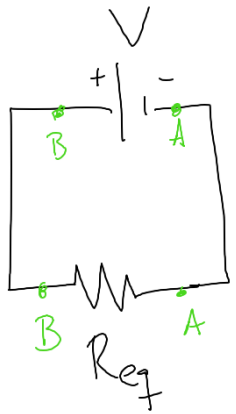
$\frac{V_1}{R_1} = \frac{V_2}{R_2} = \frac{V}{R_{eq}}$

$\frac{V_1}{R_1} = \frac{V}{R_{eq}} = \frac{V}{R_1 + R_2}$

$\frac{V_2}{R_2} = \frac{V}{R_1 + R_2}$

Interludio:





Leyes de Kirchhoff:

1) Nodos: $\sum i_e = \sum i_s$ (en un nodo)

2) Mallas: $\sum \Delta V = 0$ (en una malla)

$\Delta V_{AB} = +V$

$\Delta V_{BC} = -i_1 R_1$

$\Delta V_{CA} = -i_2 R_2$

2) $\Delta V_{AB} + \Delta V_{BC} + \Delta V_{CA} = 0$ $\quad (i = i_1 = i_2)$

$V - iR_1 - iR_2 = 0 \Rightarrow V = i(R_1 + R_2)$

$\Delta V_{AB} = +V$

$\Delta V_{BA} = -iR_{eq}$

$\Delta V_{AB} + \Delta V_{BA} = 0$

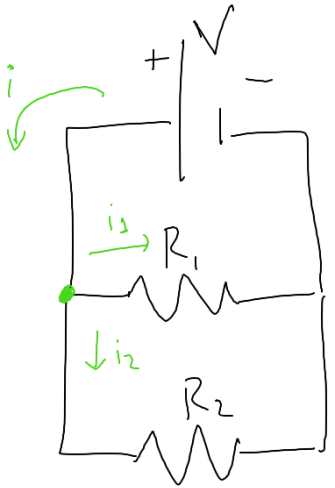
$V - iR_{eq} = 0 \Rightarrow V = iR_{eq}$

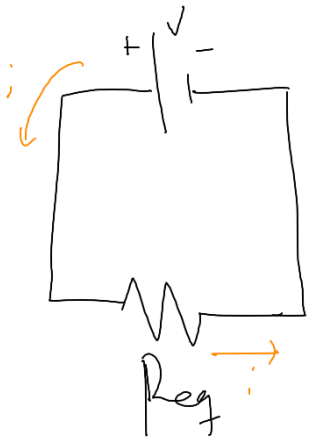
$=$

$i(R_1 + R_2) = iR_{eq}$

$\Rightarrow \boxed{R_{eq} = R_1 + R_2}$

Interludio 2.0)





$V = \Delta V_1 = \Delta V_2$

$i = i_1 + i_2$

$V = iR_{eq} \rightarrow i = \frac{V}{R_{eq}}$

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

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

$\Rightarrow R_{eq} = \frac{R_1 R_2}{R_1 + R_2}$

$\Delta V_1 = R_1 i_1 \rightarrow i_1 = \frac{\Delta V_1}{R_1}$

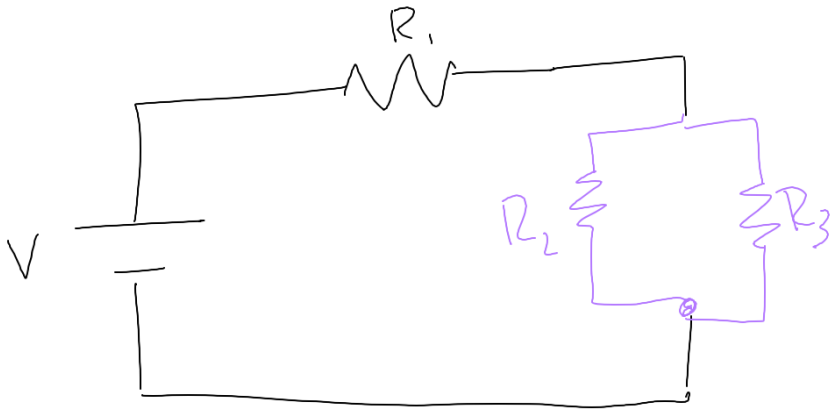
$\Delta V_2 = R_2 i_2 \rightarrow i_2 = \frac{\Delta V_2}{R_2}$

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

$\frac{\Delta V_1}{R_1} + \frac{\Delta V_2}{R_2} = \frac{V}{R_{eq}}$

$V\left(\frac{1}{R_1} + \frac{1}{R_2}\right) = V\left(\frac{1}{R_{eq}}\right)$

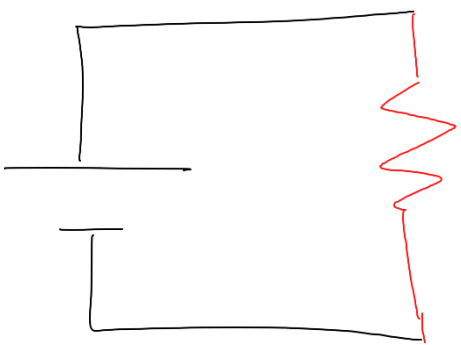
Interludio 3.0)



$\Rightarrow$

$$R_{eq}^{(2,3)} = \frac{R_2 R_3}{R_2 + R_3}$$

$\Rightarrow$

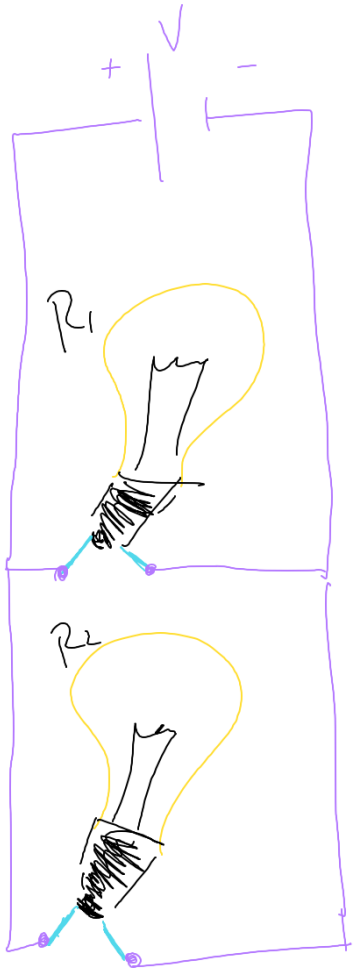


$$R_{eq} = R_1 + R_{eq}^{(2,3)} = R_1 + \frac{R_2 R_3}{R_2 + R_3}$$

$$\frac{V_1}{R_1} = \frac{V}{R_1 + R_2} \Rightarrow V_1 = V\frac{R_1}{R_{eq}} \Rightarrow P_1 = \frac{V_1^2}{R_1} = \frac{V^2 R_1^2}{R_{eq}^2}\frac{1}{R_1}$$

V_1^2

$$\Rightarrow \boxed{P_1^{(s)} = \frac{V^2}{(R_1+R_2)^2} R_1}$$



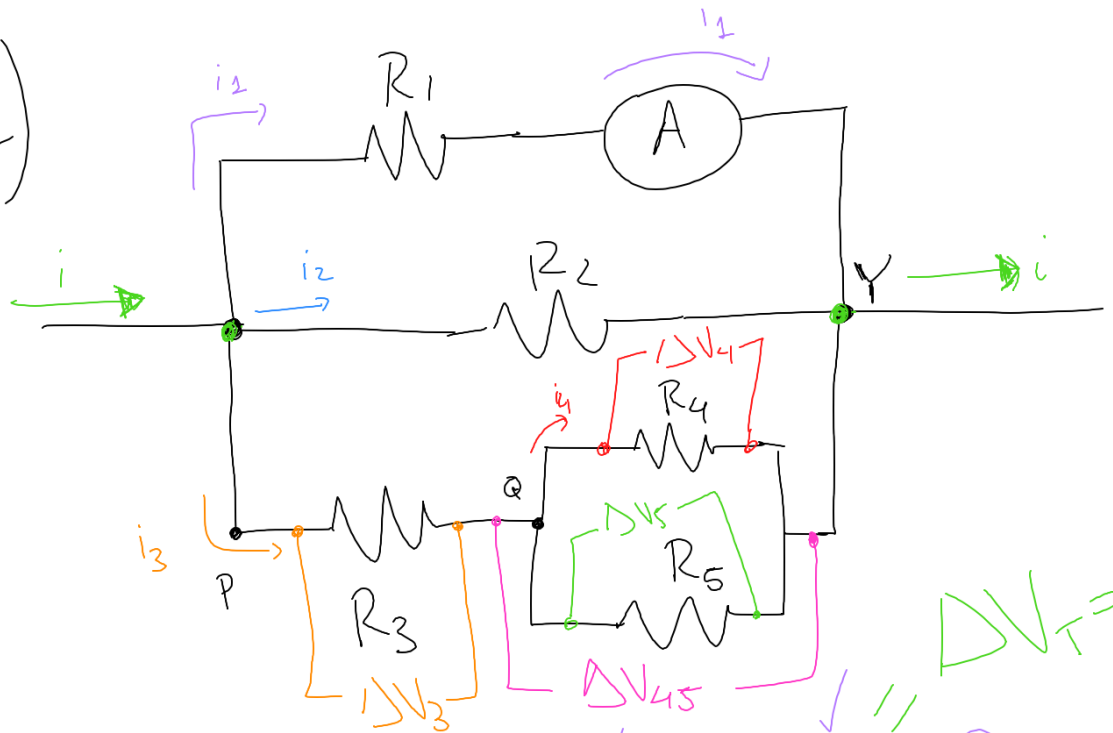
$$V = V_1 = V_2$$

$$P_1^{(P)} = \frac{V_1^2}{R_1} = \frac{V^2}{R_1}$$

$$\frac{P_1^{(P)}}{P_1^{(S)}} = \frac{\cancel{V^2}}{R_1} \cdot \frac{(R_1+R_2)^2}{\cancel{V^2} R_1}$$

$$\frac{P_1^{(P)}}{P_1^{(S)}} = \frac{(R_1+R_2)^2}{(R_1)^2} = \frac{(150\,\Omega)^2}{(100\,\Omega)^2} = 2{,}25$$

2.1.12)



$R_1 = 2{,}00\,\Omega$

$R_2 = 4{,}00\,\Omega$

$R_3 = 1{,}00\,\Omega$

$R_4 = 2{,}00\,\Omega$

$R_5 = 1{,}00\,\Omega$

$i_1 = 500\,mA$

a) $R_{45} = 0{,}667\,\Omega$

$R_{345} = 1{,}66\,\Omega$

$R_{eq} = 0{,}741\,\Omega$

b) $\Delta V_T = R_{eq}\, i$ ✓

$i_1 \rightarrow \Delta V_1 = R_1 i_1$

$\Delta V_2 = R_2 i_2 \rightarrow i_2$ ✓

$\Delta V_{345} = R_{345}\, i_3 \rightarrow i_3$ ✓ $\rightarrow \Delta V_3$ ✓✓

$$\Delta V_{345} = \Delta V_3 + \Delta V_{45} \longrightarrow \Delta V_{45} \checkmark$$

$$\| \checkmark$$

$$\Delta V_4 = R_4 i_4 \longrightarrow i_4 \checkmark$$

$$\| \checkmark$$

$$\Delta V_5$$