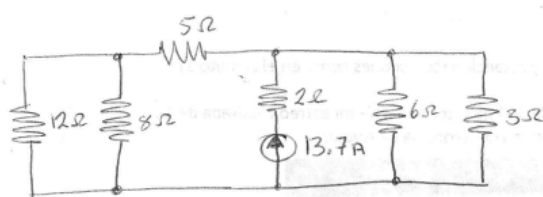
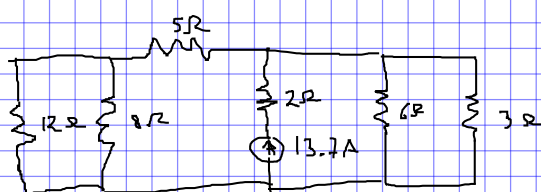


• Para el siguiente circuito en contrar las corrientes en todas las resistencias.



sol:

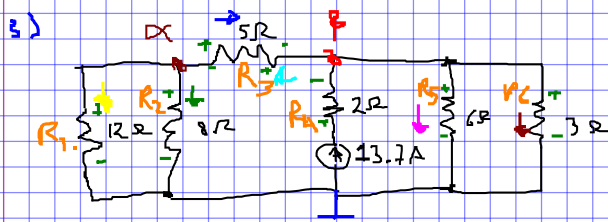
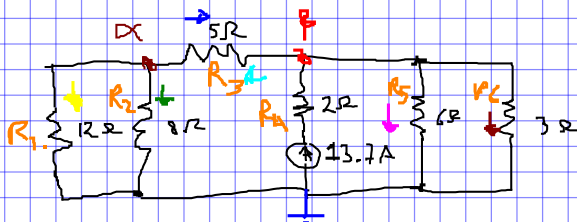


1)

$$i_{R1} = i_{R4} = 13.7 \text{ A}$$

$$i_{R2} = i_{R5} =$$

$$i_{R3} = i_{R6} =$$



4) KCL

Applying KCL at Node alfa:

$$-i_{R1} - i_{R2} - i_{R3} = 0$$

$$-\frac{V_\alpha}{R_1} - \frac{V_\alpha}{R_2} - \frac{V_\alpha - V_\beta}{R_3} = 0$$

$$-\frac{V_\alpha}{12} - \frac{V_\alpha}{8} - \frac{V_\alpha - V_\beta}{5} = 0$$

M.C.V.M.

12	8	5	2	4	24
6	4	5	2	4	24
3	2	5	2	4	24
1	1	5	3	5	1

$$-10V_\alpha - 15V_\alpha - 24V_\alpha + 24V_\beta = 0$$

$$-49V_\alpha + 24V_\beta = 0 \dots \textcircled{1}$$

Applying KCL at Node beta

$$-i_{R3} + i_{R4} - i_{R5} - i_{R6} = 0$$

$$-\frac{V_\beta - V_\alpha}{R_3} - \frac{V_\beta}{R_4} - \frac{V_\beta}{R_5} = -13.7 \text{ A}$$

$$-\frac{V_\beta - V_\alpha}{5} - \frac{V_\beta}{6} - \frac{V_\beta}{3} = -13.7 \text{ A}$$

$$-6V_\beta + 6V_\alpha - 5V_\beta - 10V_\beta = -411 \text{ V}$$

$$6V_\alpha - 21V_\beta = -411 \text{ V} \dots \textcircled{2}$$

Por sustitución:

$$V_\alpha = \frac{24V_\beta}{49} \dots \textcircled{3}$$

$$6\left(\frac{24V_\beta}{49}\right) - 21V_\beta = -411 \text{ V}$$

$$V_\beta = \frac{-411 \text{ V}}{\left(\frac{144}{49} - 21\right)} = 22.75 \text{ V}$$

$$V_\alpha = \frac{24}{49}(22.75 \text{ V}) = 11.14 \text{ V}$$

Applying Ohm's Law

$$i_{R1} = \frac{V_\alpha}{R_1} = \frac{11.14 \text{ V}}{12 \Omega} = 0.92 \text{ A}$$

$$i_{R2} = \frac{V_\alpha}{R_2} = \frac{11.14 \text{ V}}{8 \Omega} = 1.39 \text{ A}$$

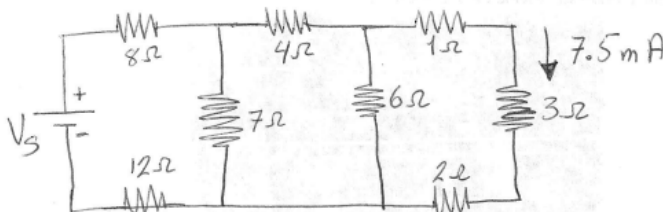
$$i_{R3} = \frac{V_\alpha - V_\beta}{R_3} = \frac{11.14 \text{ V} - 22.75 \text{ V}}{5 \Omega} = -2.32 \text{ A}$$

$$i_{R4} = 13.7 \text{ A}$$

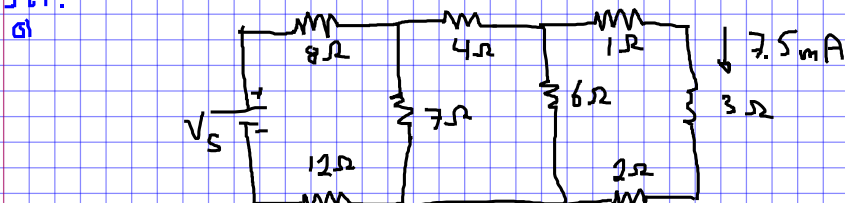
$$i_{R5} = \frac{V_\beta}{R_5} = \frac{22.75 \text{ V}}{6 \Omega} = 3.79 \text{ A}$$

$$i_{R6} = \frac{V_\beta}{R_6} = \frac{22.75 \text{ V}}{3 \Omega} = 7.58 \text{ A}$$

• Para el siguiente circuito encuentres la fuente de Voltaje V_s la cual da como resultado una corriente de 7.5 mA en el resistor de 3Ω.

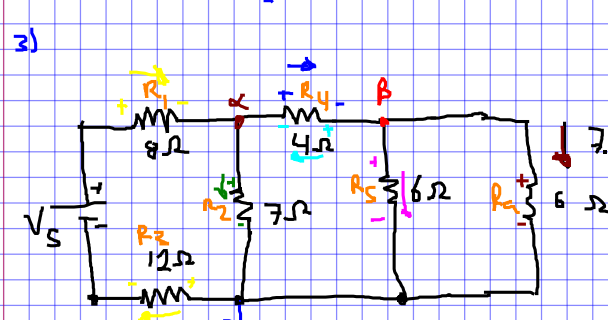
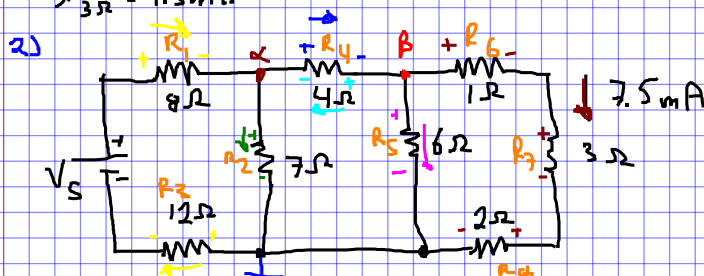


sol:



1) $V_s = ?$

$$i_{3\Omega} = 7.5 \text{ mA}$$



$$V_\beta = R_\alpha i_{R_\alpha}$$

$$= (6\Omega)(7.5 \text{ mA})$$

$$= 45 \text{ mV}$$

4)

Applying KCL at Node alfa

$$\frac{V_s - V_\alpha}{8\Omega} - \frac{V_\alpha}{7\Omega} - \frac{V_\alpha - V_\beta}{4\Omega} = 0$$

$$7V_s - 3V_\alpha - 8V_\alpha - 14V_\alpha + 14V_\beta = 0$$

$$-29V_\alpha + 14V_\beta + 7V_s = 0$$

$$-29V_\alpha + 7V_s = -14(45 \text{ mV})$$

$$-29V_\alpha + 7V_s = -630 \text{ mV} \dots \textcircled{1}$$