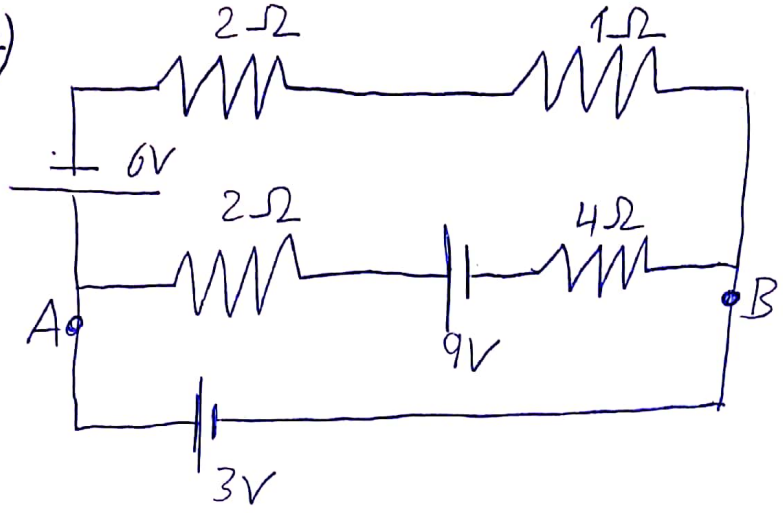
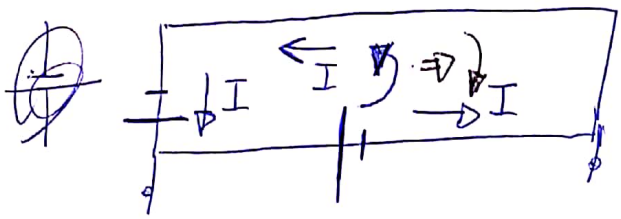
7)



Calcula la corriente que circula por el generador de 3V.

Primero hallamos el equivalente Thevenin.



$$I = \frac{\Sigma_V}{R_T} = \frac{-9+6}{2+4+1+2} = \frac{-3}{9} = -\frac{1}{3}$$

La I va en sentido contrario. $I = 1/3$ A

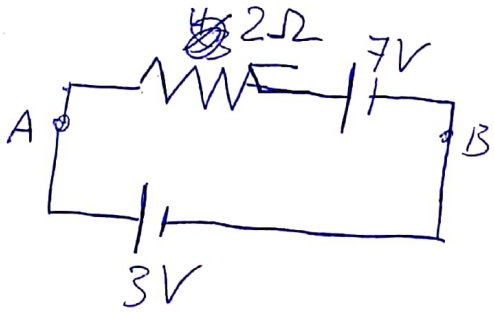
Ahora calculamos $V_{th} = V_A - V_B = 1/3\,(2+4) - 9 = -7$

Ahora " R_{th}.

$$R_{th} = \frac{R_1 \cdot R_2}{R_1 + R_2} = \frac{3 \cdot 6}{3+6} = \frac{18}{9} = 2\,\Omega$$

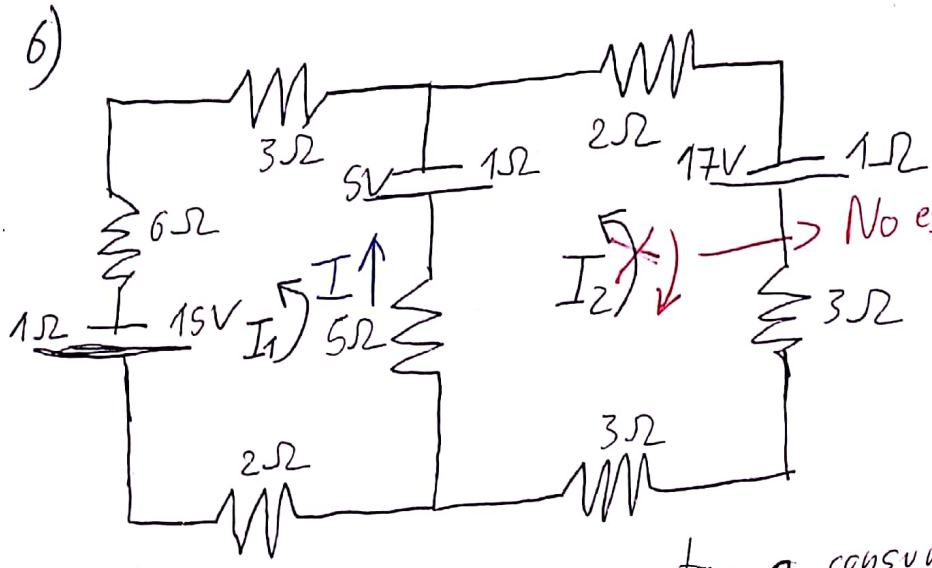
$R_1 = 2+1 = 3\,\Omega$

$R_2 = 2+4 = 6\,\Omega$



$$I_2 = \frac{\Sigma V}{\Sigma R} = \frac{7 - 3}{2} = \frac{10}{2} = 2\,A$$

6)



No está mal, el rojo es una corrección

Calcula la potencia que aportan o consumen las f.e.m en el segundo caso

Malla 1

$$I_1(5+1+3+6+1+2) - I_2(1+5) = -5+15 \Rightarrow$$

$$\Rightarrow 18I_1 - 6I_2 = 10$$

Malla 2

$$I_2(3+1+2+1+5+3) - I_1(5+1) = -17+5 \Rightarrow$$

$$-6I_1 + 15I_2 = -12 \Rightarrow -6I_1 + 15\left(-\frac{2}{3}\right) = -12$$

$$-6I_1 - 10 = -12$$

$$-6I_1 = -2$$

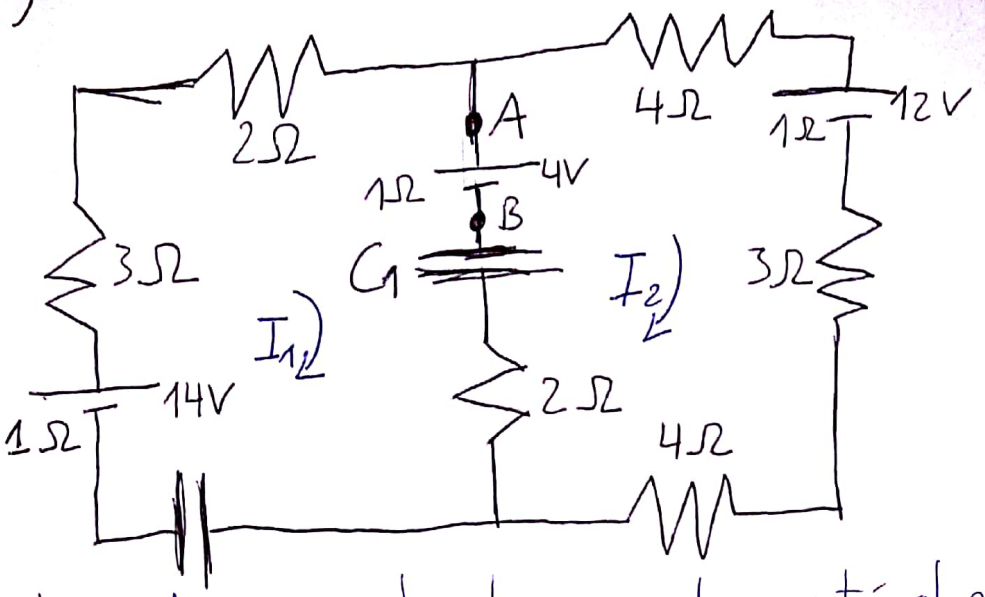
$$\left[I_1 = \frac{1}{3}\right]$$

$$\left.\begin{aligned} 18I_1 - 6I_2 &= 10 \\ -6I_1 + 15I_2 &= -12 \end{aligned}\right\} \xrightarrow{\times 3}$$

$$\begin{aligned} 18I_1 - 6I_2 &= 10 \\ +\,-18I_1 + 45I_2 &= -36 \\ \hline 0 \quad 39I_2 &= -26 \end{aligned}$$

$$\left[I_2 = -\frac{2}{3} = \frac{2}{3}\,A\right]$$

10)



$C_1 = 20nF$
$C_2 = 50nF$

a) Cuando hay condensadores: mientras está el proceso de carga circula corriente.

$$V_A - V_B = \sum_k i_k R_k - \left(\sum_k \varepsilon_k\right)$$

- **Malla 1**

$$I_1(1+2+1+3+2) - I_2(2+1) = -4+14 \Rightarrow 9I_1 - 3I_2 = 10$$

Malla 2

$$I_2(1+3+4+2+1+4) - I_1(2+1) = -12+4 \Rightarrow -3I_1 + 15I_2 = -8$$

- $9I_1 - 3I_2 = 10 \Rightarrow 9I_1 - 3I_2 = 10$

$-3I_1 + 15I_2 = -8 \overset{\times 3}{\Rightarrow} -9I_1 + 45I_2 = -24$ (+)

$0 \quad 42I_2 = -14$

$$I_2 = -\frac{1}{3}\,A \Rightarrow \frac{1}{3} = I_2$$

$9I_1 - 3I_2 = 10$

$9I_1 - 3\left(-\frac{1}{3}\right) = 10$

$9I_1 + 1 = 10$

$9I_1 = 9$

$I_1 = 1\,A$

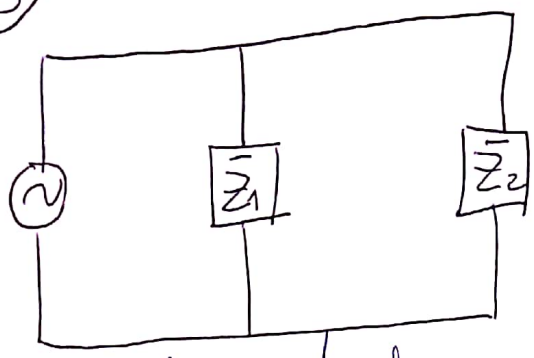
- $i_1 = 1\,A$

$i_2 = \frac{1}{3}\,A$

$i_3 = \frac{4}{3}\,A$

$V_A - V_B = i_3 R - (-4) = 5{,}33\,V$

13/



Datos

$\bar{Z}_1 = -10j\ \Omega$

$\bar{Z}_2 = 10\angle 36{,}87°$

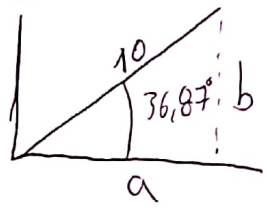
a) Calculamos la forma polar de $\bar{Z}_1$ y la forma binómica de $\bar{Z}_2$

$\bar{Z}_1$

$Z_1 = \sqrt{0^2 + (-10)^2} = 10$

$\varphi = \text{arc tg } \frac{-10}{0} = 90°$ $\Big\}\ \bar{Z}_1 = 10\angle 90°$

$\bar{Z}_2$



$a = 10 \cos 36{,}87° = 8$

$b = 10 \operatorname{sen} 36{,}87° = 6$ $\Big\}\ \bar{Z}_2 = 8 + 6j$

Ahora calculamos $\bar{Z}_e$

$$\bar{Z}_e = \frac{Z_1 \cdot Z_2}{Z_1 + Z_2} = \frac{10\angle 90° \cdot 10\angle 36{,}87°}{-10j + (8+6j)} = \frac{100\angle 36{,}87°}{8 - 4j} = \frac{100\angle 36{,}87°}{4\sqrt{5}\angle -26{,}57} =$$

$$= 5\sqrt{5}\angle 63{,}44$$

$Z_o = \sqrt{8^2 + (-4)^2} = 4\sqrt{5}$

$\varphi = \text{arc tg } \frac{-4}{8} = -26{,}57$ $\Big\}\ Z = 4\sqrt{5}\angle -26{,}57$

$a = 5\sqrt{5} \cos 63{,}44 = 5$

$b = 5\sqrt{5} \operatorname{sen} 63{,}44 = 10$

$$[Z_e = 5 + 10j\ \Omega]$$