CIRC1

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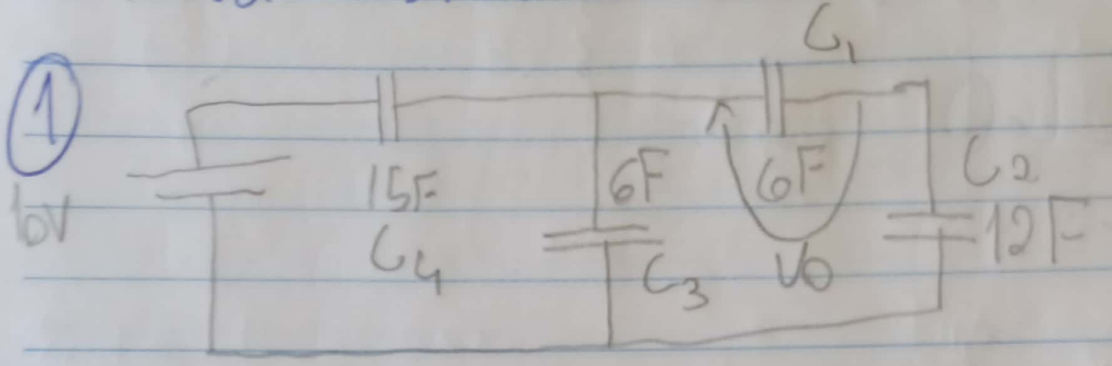
① 

$C_{1,2} = \frac{6 \cdot 12}{6+12} = 4F$ (série)

$C_{1,2,3} = 4 + 6 = 10F$ (paralelo)

$C_{1,2,3,4} = \frac{10 \cdot 15}{25} = 6F$ (série)

$Q_t = 6 \cdot 10 = 60C \quad Q_4 = Q_{1,2,3} = 60C$

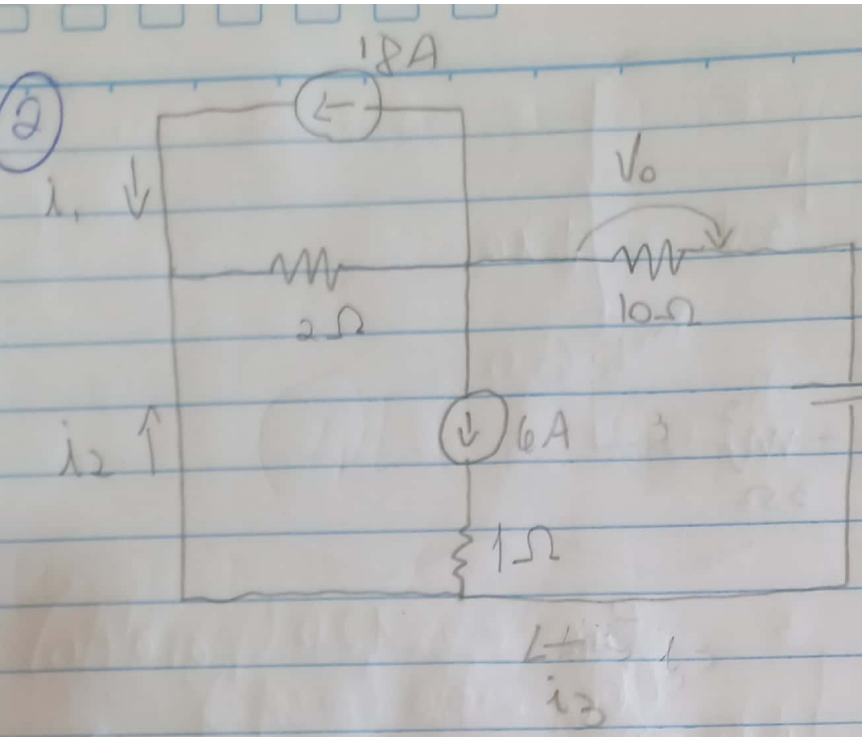
$V_{1,2,3} = V_{1,2} = \frac{Q_{1,2,3}}{C_{1,2,3}} = \frac{60}{10} = 6V$

$Q_{1,2} = V_{1,2} \cdot C_{1,2} = 6 \cdot 4 = 24C = Q_1 = Q_2$

$Q_2 = V_0 \cdot C_1 \Rightarrow V_0 = \frac{Q_1}{C_1} = \frac{24}{6} = 4V$

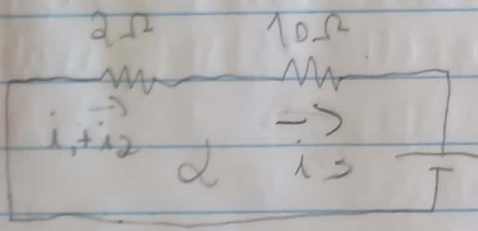
$\boxed{V_0 = 4V}$

(2)



$i_1 = 18A$

$i_2 - i_3 = 6$



$\sum_i V_\alpha = 0 \Rightarrow 2(18+i_2) + 10i_3 + 12 = 0$

$2i_2 + 10i_3 = -48$

$i_2 + 5i_3 = -24$

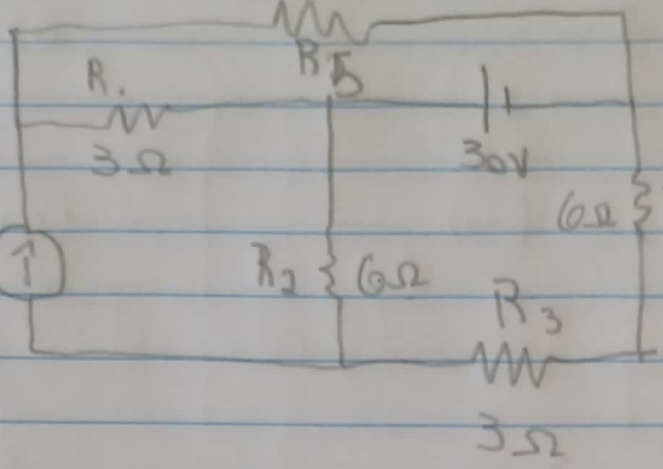
$$\begin{cases} i_2 - i_3 = 6 \\ i_2 + 5i_3 = -24 \end{cases}$$

$0 - 6i_3 = -30 \Rightarrow \boxed{i_3 = 5A}$

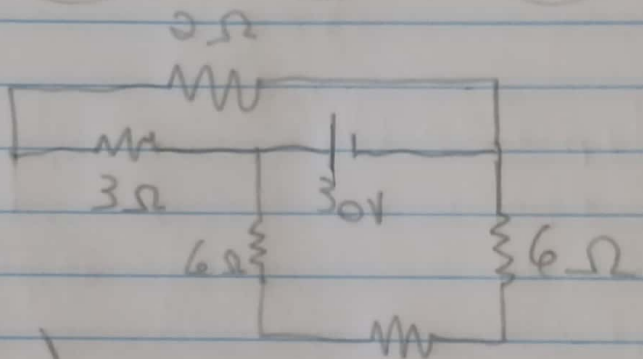
$V_o = 10 \cdot i_3 = 10 \cdot 5 = 50\,V$

$$\boxed{V_o = 50V}$$

3)



Fonte 1:



$\downarrow i_1 \quad \uparrow i_y$

$R_{1,5} = 5\,\Omega$ (série)

$R_{eq} = \frac{5 \cdot 15}{20} = 3{,}75$ (paralelo)

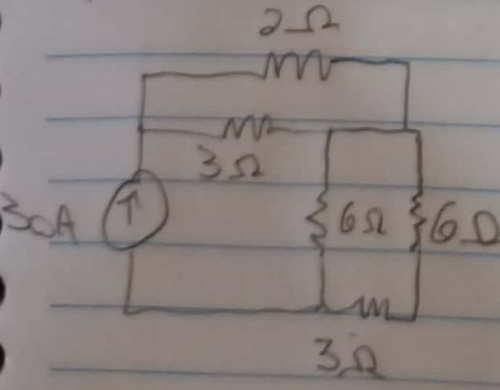
$R_{2,3,4} = 15\,\Omega$ (série)

$i_t = \frac{30}{R_{eq}} = 8A$

$i_y = \frac{i_t \cdot 5}{20} = \frac{8 \cdot 5}{20} = 2A$

$i_1 = -i_y = -2A$

Fonte 2:



$R_{1,5} = \frac{2 \cdot 3}{5} = 1{,}2\,\Omega$ (paralelo)

$R_{3,4} = 3 + 6 = 9\,\Omega$ (série)

$i_2 = \frac{i_t \cdot 6}{15} = 12A$ (divisor de corrente)

$i_0 = i_1 + i_2 = 12 - 2 = 10A$

$i_0 = 10A$