①

$i_1 = 6/3 = 2A \qquad i_2 = 6/3 = 2A$

$i_3 = i_1 + i_2 = 4A.$
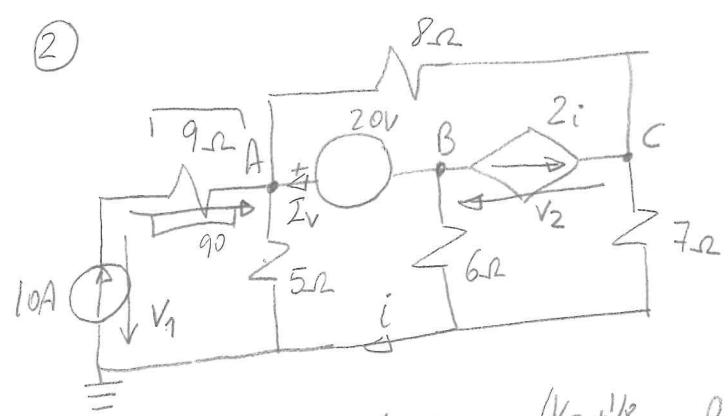
$\boxed{P_{6V} = 6 \cdot i_3 = 6 \cdot 4 = 24W}$ (gen)

$V_I = 5 \cdot 2 = 10V$

$\boxed{P_{5A} = 5 \cdot V_I = 5 \cdot 10 = 50W}$ (gen)

$E_C = \frac{1}{2} C V_C^2 = \frac{1}{2} 2 (10)^2 = 100J$

$E_L = \frac{1}{2} 3 \cdot (2)^2 + \frac{1}{2} 2 (4)^2 + \sqrt{6} \cdot 2 \cdot 4 = 41,59J$

$M = 1 \cdot \sqrt{2 \cdot 3}$

②

$$\begin{pmatrix} 1/5 + 1/8 & 0 & -1/8 \\ 0 & 1/6 & 0 \\ -1/8 & 0 & 1/7 + 1/8 \end{pmatrix} \begin{pmatrix} V_A \\ V_B \\ V_C \end{pmatrix} = \begin{pmatrix} 10 + I_v \\ -I_v - 2i \\ 2i \end{pmatrix}$$

Ec adicionales:

$V_A - V_B = 20$

$i = \dfrac{V_B}{6} + \dfrac{V_C}{7}$

$$\begin{pmatrix} 1/5 + 1/8 & 0 & -1/8 & -1 \\ 0 & 1/6 + 1/3 & 2/7 & +1 \\ -1/8 & -1/3 & 1/7 + 1/8 - 2/7 & 0 \\ 1 & -1 & 0 & 0 \end{pmatrix} \begin{pmatrix} V_A \\ V_B \\ V_C \\ I_v \end{pmatrix} = \begin{pmatrix} 10 \\ 0 \\ 0 \\ 20 \end{pmatrix}$$
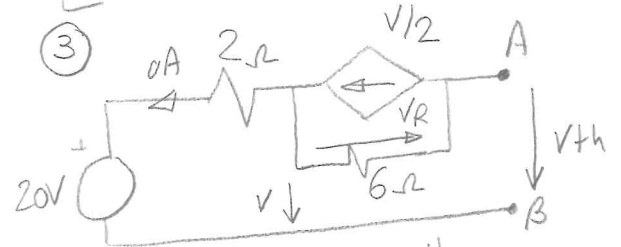
$V_A = 12,12 V \qquad V_B = -7,87V \qquad V_C = 62,22V \qquad \boxed{I_v = -13,83A}$

$\boxed{i = \dfrac{-7,87}{6} + \dfrac{62,22}{7} = 7,57A}$

$\boxed{P_{20} = 20 \cdot I_v = -276,6 W.}$

$\boxed{P_{10} = 10 \cdot V_1 = 10(V_A + 9 \cdot 10) = +1021.2W}$
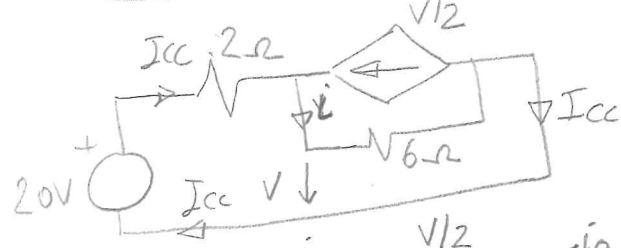
$\boxed{P_{2i} = 2i \cdot (V_C - V_B) = 1061,16W}$

③

$V = 20 \qquad V_R = \dfrac{V}{2} \cdot 6 = 3V$

$\boxed{V_{th} = -V_R + V = -3V + V = -2V = -40V}$

$20 = 2I_{cc} + V \Rightarrow V = 20 - 2I_{cc}$

$i = I_{cc} + V/2 = I_{cc} + 10 - I_{cc} = 10$ ⟹
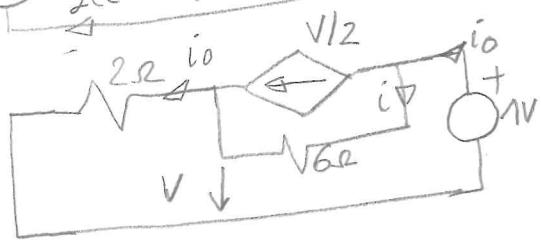
$V = 6i = 60V.$

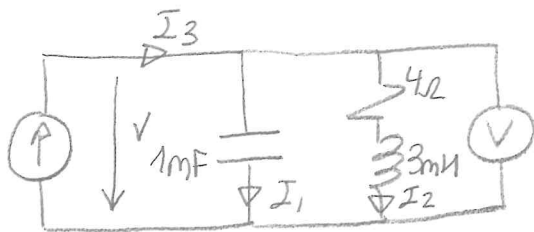$\Rightarrow 60 = 20 - 2 \cdot I_{cc} \Rightarrow \boxed{I_{cc} = -20A}$

$V = 2i_0$

$i = i_0 - V/2 = i_0 - i_0 = 0A$

$V = 1$

$i_0 = \dfrac{V}{2} = \dfrac{1}{2}$

$\boxed{R_{th} = \dfrac{1}{i_0} = 2\Omega}$

④

$$V = 50 \underline{/0°}$$

$$I_1 = \frac{50 \underline{/0°}}{1 \underline{/-90°}} = 50 \underline{/90°} = 50 j$$

$$I_2 = \frac{50 \underline{/0°}}{4 + 3j} = \frac{50 \underline{/0°}}{5 \underline{/36,86°}} = 10 \underline{/-36,86°}$$

$$I_3 = I_1 + I_2 = 50 j + 8 - 6j = 8 + 44 j = 44,72 \underline{/79,69°}$$

$$\boxed{P = |V| \cdot |I_3| \cdot \cos(V, \hat{I_3}) = 50 \cdot 44,72 \cdot \cos(-79,69) = 400,18 W}$$

$$\boxed{Q = |V| \cdot |I_3| \cdot \sin(V, \hat{I_3}) = 50 \cdot 44,72 \, \sin(-79,69) = -2200 \, VAr}$$

⑤
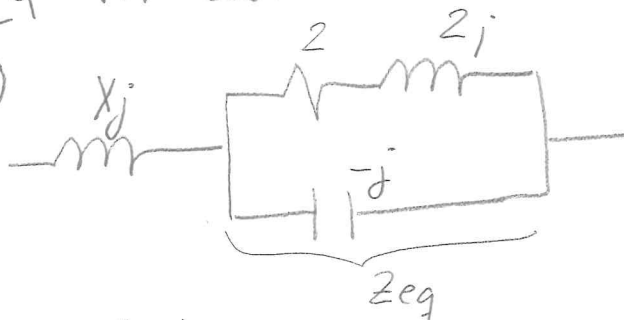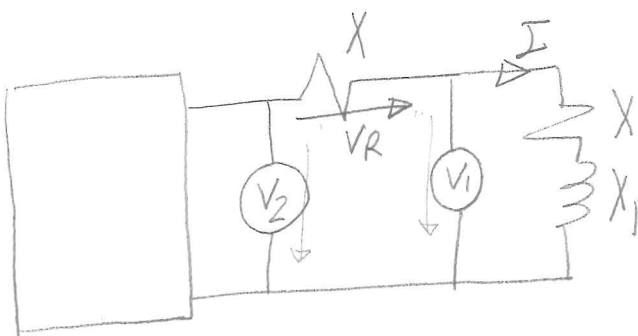

$$Z_{eq} = \frac{(-j)(2 + 2j)}{-j + 2 + 2j} = 0,4 - 1,2 j$$

$$\boxed{X = 1,2 \, \Omega}$$

$$V = \frac{(-j) \cdot 10}{2 + 2j} \, 2j = 5 - 5j \qquad \boxed{|V| = 7,07 V}$$

⑥

$$V_1 = 100 V$$

$$I = \frac{100}{X + Xj}$$

$$V_R = X \cdot I = X \frac{100}{X + Xj} = \frac{100}{1 + 1j}$$

$$V_2 = 100 + \frac{100}{1 + j} = 150 - 50 j \qquad \boxed{|V_2| = 158,11 V}$$