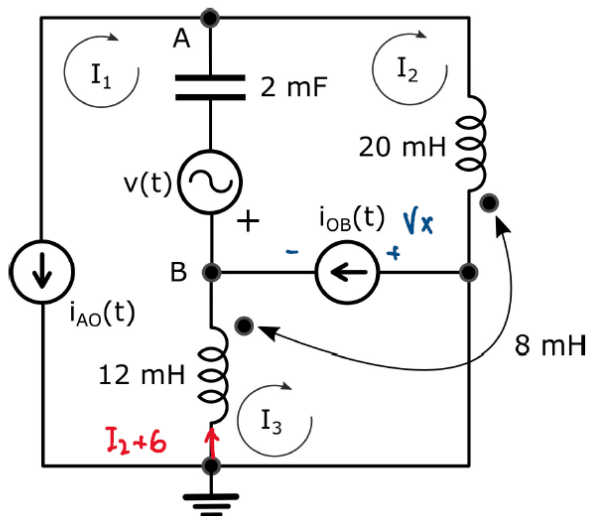


Examen 26 enero 2021 - Alterna.



$$L_1 = 20\text{mH} \rightarrow 20 \times 10^{-3} \cdot 0,25 \times 10^3 j = 5j\Omega$$

$$L_2 = 12\text{mH} \rightarrow 3j\Omega$$

$$C = 2\text{mF} \rightarrow \frac{j}{2 \times 10^{-3} \cdot 0,25 \times 10^3} = -2j\Omega$$

$$i_{A0}(t) = 6\sqrt{2} \cos(250t) \rightarrow 6 \text{ A}$$

$$i_{0B}(t) = 10\sqrt{2} \cos(250t) \rightarrow 10 \text{ A}$$

$$v(t) = 20\sqrt{2} \cos(250t) \rightarrow 20 \text{ V}$$

Ecuaciones de malla:

$$I_1 = -6 \text{ A}$$

Malla 2

$$-2j(I_2 + 6) + 20 + 5j \cdot I_2 + V_x + (I_3 + 6) \cdot 2j = 0$$

Malla 3

$$3j(I_3 + 6) - V_x + 2jI_2 = 0 ; I_2 - I_3 = 10 ; I_3 = I_2 - 10$$

(2) + (3)

$$-2j(I_2 + 6) + 20 + 5j \cdot I_2 + (I_2 - 10 + 6) \cdot 2j + 3j(I_2 - 10 + 6) + 2j \cdot I_2 = 0$$

$$I_2(-2j + 5j + 2j + 3j + 2j) = 12j - 20 + 8 + 12j$$

$$I_2 \cdot 10j = -20 + 32j ; I_2 = 3,77 \angle 32^\circ \text{ A} ; I_3 = 7,09 \angle 163,6^\circ \text{ A}$$

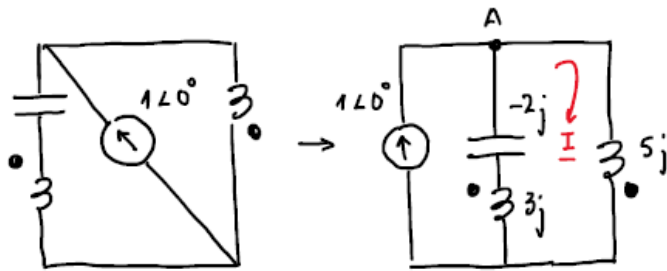
$$V_A = 5jI_2 + 2j(I_3 + 6) ; V_A = 20,07 \angle 134,2^\circ \text{ V}$$

$$V_B = V_A + (I_2 + 6)(-2j) + 20 = 10,8 \angle -21,85^\circ \text{ V}$$

$$\text{O bien } V_B = -3j(I_3 + 6) - 2jI_2 = 10,8 \angle -21,85^\circ \text{ V}$$

$$S_V = -20 (6 + I_2)^* = 188,23 < 167,7^\circ = 18,4 + 40j \text{ VA}$$

Impedancia de Thévenin entre A y tierra



$$5jI + (3j - 2j)(I - 1) + 2jI + 2j(I - 1) = 0$$

$$(5j + j + 2j + 2j)I = j + 2j$$

$$I = \frac{3j}{10j} = 0,3 \text{ A}$$

$$V_A = 5j \cdot I + 2j(I - 1)$$

$$V_A = 0,1j \text{ V}$$

$$Z_{th} = \frac{V_A}{1 \angle 0^\circ} = 0,1j \Omega$$

