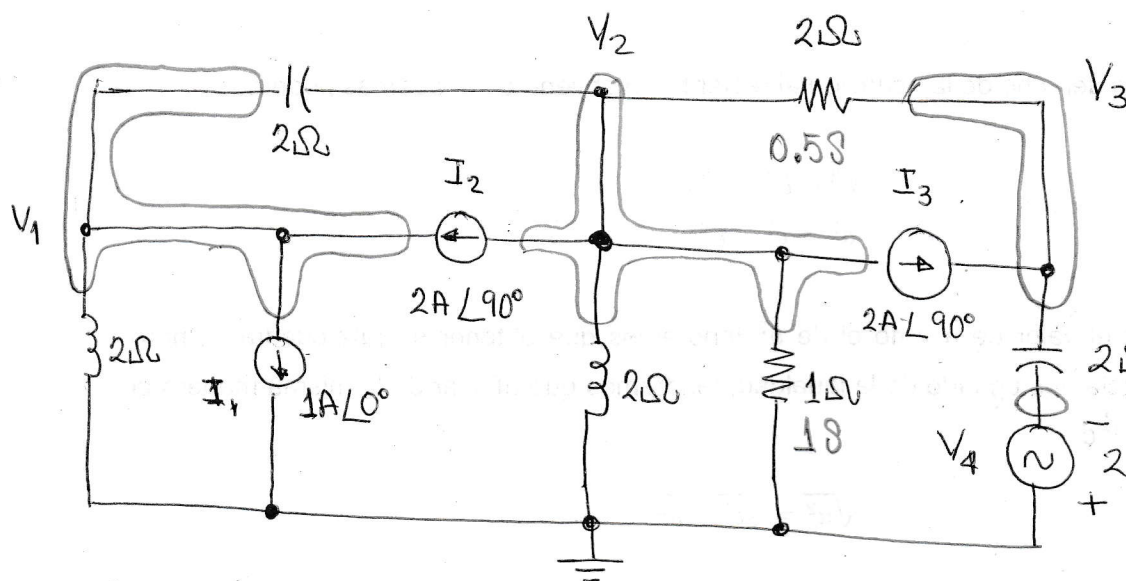


Pregunta 2 Calcule los voltajes de Nodo

Hoja 1



Cambiar a admitancias

$$X_C = 2 \angle -90^\circ$$

$$Y_C = \frac{1}{2} \angle 90^\circ$$

$$X_L = 2 \angle 90^\circ$$

$$Y_L = \frac{1}{2} \angle -90^\circ$$

Consideraciones: $V_4 = 2V \angle 0^\circ$

Ecuaciones de Nodo

$$N1: V_1 \left(\frac{1}{2} \angle -90^\circ + \frac{1}{2} \angle 90^\circ \right) - V_2 \left(\frac{1}{2} \angle 90^\circ \right) + 1A \angle 0^\circ - 2A \angle 90^\circ = 0$$

$$N2: -V_1 \left(\frac{1}{2} \angle 90^\circ \right) + V_2 \left(0.5S + 1S + \frac{1}{2} \angle 90^\circ + \frac{1}{2} \angle -90^\circ \right) - V_3 (0.5) + 2 \angle 90^\circ + 2 \angle 90^\circ = 0$$

$$N3: -V_2 (0.5) + V_3 (0.5 + 0.5 \angle 90^\circ) - 2A \angle 90^\circ - (2 \angle 0^\circ)(0.5 \angle 90^\circ) = 0$$

Pasando a forma matricial

$$\begin{bmatrix} 0 & -j0.5 & 0 \\ -j0.5 & 1.5 & -0.5 \\ 0 & -0.5 & 0.5 + j0.5 \end{bmatrix} \begin{bmatrix} V_1 \\ V_2 \\ V_3 \end{bmatrix} = \begin{bmatrix} -1 + j2 \\ -j4 \\ j3 \end{bmatrix}$$

\Downarrow

$$\Downarrow = \Pi$$

Para determinar el valor de V

$$V = Y^{-1} \cdot I$$

Hoja 2

De este modo

$$V = \begin{bmatrix} 5+j & j2 & 1+j \\ j2 & 0 & 0 \\ 1+j & 0 & 1-j \end{bmatrix} \begin{bmatrix} -1+j2 \\ -j4 \\ j3 \end{bmatrix}$$

$$V_1 = -2 + j12 = 12.17 \text{ V} \angle 99.46^\circ$$

$$V_2 = -4 - j2 = 4.47 \text{ V} \angle -153.43^\circ$$

$$V_3 = j4 = 4 \text{ V} \angle 90^\circ$$