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Prova AV3 - Electricidade CC

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Turma: SI em Telemática

$$\textcircled{1} \begin{bmatrix} 1 & 3 & 0 & 2 & -3 \\ 2 & 0 & 1 & 1 & 1 \\ 1 & -3 & 0 & 2 & 2 \\ 2 & 0 & 0 & 1 & 2 \\ 1 & 0 & 1 & 1 & 2 \end{bmatrix}$$

$$\textcircled{I} \left[\begin{array}{c|ccc|ccc} -1^{1+2} \cdot 3 & 2 & \textcircled{1} & 1 & 1 & +(-1)^{3+2} \cdot (-3) & 1 & 0 & 2 & -3 \\ \hline & 1 & 0 & 2 & 2 & & 2 & 1 & 1 & 1 \\ & 2 & 0 & 1 & 2 & & 2 & 0 & 1 & 2 \\ & 1 & \textcircled{1} & 1 & 2 & & 1 & 1 & 1 & 2 \end{array} \right] =$$

$$\therefore -1^{1+2} \cdot 1 - \left[\begin{array}{ccc|ccc} 1 & 2 & 2 & 2 & 1 & 1 \\ \hline & 2 & 1 & 2 & & \\ & 1 & 1 & 2 & & \end{array} \right] + (-1)^{4+2} \cdot 1 \cdot \left[\begin{array}{ccc|ccc} 2 & 1 & 1 & & & \\ \hline & 1 & 2 & 2 & & \\ & 2 & 1 & 2 & & \end{array} \right] =$$

$$\begin{array}{|ccc|ccc|} \hline 1 & 2 & 2 & 1 & 2 & \\ \hline 2 & 1 & 2 & 2 & 1 & \\ \hline 1 & 1 & 2 & 1 & 1 & \\ \hline \end{array}$$

$$\therefore 2 + 2 + 2 - (2 + 2 + 8) = 10 - 2 - 2 - 8 = 10 - 12 = \boxed{-2}$$

$$\begin{array}{|ccc|ccc|} \hline 2 & 1 & 1 & 2 & 1 & \\ \hline 1 & 2 & 2 & 1 & 2 & \\ \hline 2 & 1 & 2 & 2 & 1 & \\ \hline \end{array}$$

$$\therefore 8 + 2 + 1 - (2 + 2 + 2) = 13 - 2 - 2 - 2 = 13 - 6 = \boxed{3}$$

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$$\textcircled{\text{II}} \begin{vmatrix} 1 & 0 & 2 & -3 \\ 2 & 1 & 1 & 1 \\ 2 & 0 & 1 & 2 \\ 1 & 1 & 1 & 2 \end{vmatrix}$$

Δ pontu și drept...

$$-1^{2+2} \cdot 1 \cdot \begin{vmatrix} 1 & 2 & -3 \\ 2 & 1 & 2 \\ 1 & 1 & 2 \end{vmatrix} + (-1)^{4+2} \cdot 1 \cdot \begin{vmatrix} 1 & 2 & -3 \\ 2 & 1 & 1 \\ 2 & 1 & 2 \end{vmatrix} =$$

$$\begin{vmatrix} 1 & 2 & -3 & 1 & 2 \\ 2 & 1 & 1 & 2 & 1 \\ 1 & 1 & 2 & 1 & 1 \end{vmatrix} \therefore 2 + 4 + (-6) - ((-3) + 2 + 8) = 0 + 3 - 10 = \boxed{-7}$$

$$\begin{vmatrix} 1 & 2 & -3 & 1 & 2 \\ 2 & 1 & 1 & 2 & 1 \\ 2 & 1 & 2 & 2 & 1 \end{vmatrix} \therefore 2 + 4 + (-6) - ((-6) + 1 + 8) = 0 + 6 - 9 = \boxed{-3}$$

⊗ Pela fórmula:

$$-1^3 \cdot 1 \cdot (-2) + (-1)^6 \cdot 1 \cdot 3 =$$

$$-1 \cdot (-2) + 1 \cdot 3 =$$

$$2 + 3 = \boxed{5}$$

$$-1^4 \cdot 1 \cdot (-7) + (-1)^6 \cdot 1 \cdot (-3) =$$

$$1 \cdot (-7) + 1 \cdot (-3) =$$

$$-7 - 3 = \boxed{-10}$$

⊗ Pela fórmula final:

$$-1^3 \cdot 3 \cdot (5) + (-1)^5 \cdot (-3) \cdot (-10) =$$

$$-1 \cdot 3 \cdot 5 + (-1) \cdot (-3) \cdot (-10) =$$

$$-3 \cdot 5 + 3 \cdot (-10) =$$

$$-15 + (-30) =$$

$$-15 - 30 = \boxed{-45}$$

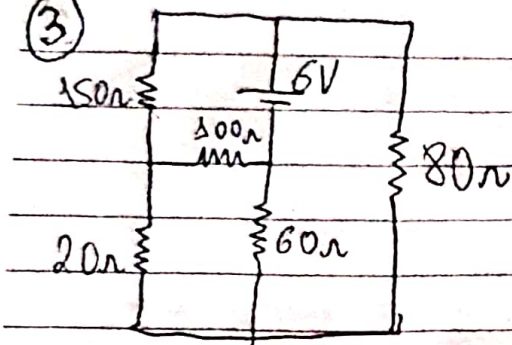
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③



①

$$M_1 = 150 \cdot I_1 - 6 - 100I_1 + 100I_3 = 0$$

$$M_1 = 250I_1 + 100I_3 = 6 \quad | :2 |$$

$$M_1 = -125I_1 + 50I_3 = 3$$

$$M_2 = 60I_3 - 60I_2 + 6 - 80I_2 = 0$$

$$M_2 = 140I_2 + 60I_3 = -6 \quad | :2 |$$

$$M_2 = -70I_2 + 30I_3 = -3$$

$$M_3 = -20I_1 - 100I_3 + 100I_1 - 60I_3 + 60I_2 = 0$$

$$M_3 = 100I_1 + 60I_2 - 180I_3 = 0 \quad | :10 |$$

$$M_3 = 10I_1 + 6I_2 - 18I_3 = 0$$

②

$$\Delta = \begin{vmatrix} -125 & 0 & 50 \\ 0 & -70 & 30 \\ 10 & 6 & -18 \end{vmatrix} \begin{vmatrix} -125 & 0 \\ 0 & -70 \\ 10 & 6 \end{vmatrix}$$

$$\Delta = (-157.500 + 0 + 0) - (-35.000 - 22.500 - 0)$$

$$\Delta = -157.500 + 57.500$$

↳

$$\Delta = -100.000$$

$$\textcircled{\text{III}} \text{ N13} \left| \begin{array}{ccc|cc} 3 & 0 & 50 & 3 & 0 \\ -3 & -70 & 30 & -3 & 70 \\ 0 & 6 & -38 & 0 & 6 \end{array} \right.$$

$$\rightarrow (3780 + 0 - 900) - (0 + 540 + 0) = 2880 - 540 = \boxed{2340}$$

$$\text{N12} \left| \begin{array}{ccc|cc} -125 & 3 & 50 & -125 & 3 \\ 0 & -3 & 30 & 0 & -3 \\ 30 & 0 & -38 & 30 & 0 \end{array} \right.$$

$$\rightarrow (-6750 + 900 + 0) - (-1500 - 0 - 0) = -5850 + 1500 = \boxed{-4350}$$

$$\text{N13} \left| \begin{array}{ccc|cc} -125 & 0 & 3 & -125 & 0 \\ 0 & -70 & -3 & 0 & 70 \\ 30 & 6 & 0 & 30 & 6 \end{array} \right.$$

$$\rightarrow (0 - 0 + 0) - (-2300 + 2250 + 0) = \boxed{-150}$$

$$I_1 = \frac{\text{N11}}{\Delta} \rightarrow \frac{2340}{-100000} = \boxed{-0,0234}$$

$$I_2 = \frac{\text{N12}}{\Delta} \rightarrow \frac{-4350}{-100000} = \boxed{0,0435}$$

$$I_3 = \frac{\text{N13}}{\Delta} \rightarrow \frac{-150}{-100000} = \boxed{0,0015}$$