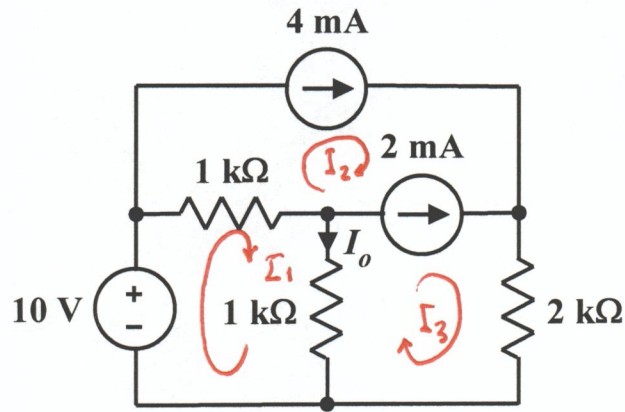


EE 2240
Problem #07

Use mesh analysis to find I_o .



$$-10 + 1000(I_1 - I_2) + 1000(I_1 - I_3) = 0 \quad (\text{mesh 1})$$

$$I_2 = 4 \text{ mA} \quad (\text{mesh 2})$$

$$I_3 - I_2 = 2 \text{ mA} \quad (\text{mesh 2, 3})$$

In matrix form:

$$\begin{bmatrix} 2000 & -1000 & -1000 \\ 0 & 1 & 0 \\ 0 & -1 & 1 \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \\ I_3 \end{bmatrix} = \begin{bmatrix} 10 \\ 0,004 \\ 0,002 \end{bmatrix}$$

Solving yields $I_1 = 10 \text{ mA}$ and $I_3 = 6 \text{ mA}$

$$\text{Then } I_o = I_1 - I_3 = 4 \text{ mA}$$