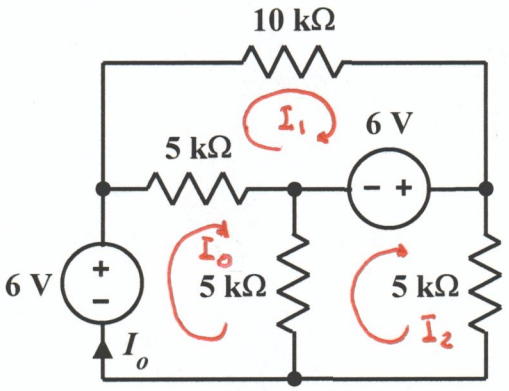
EE 2240

Problem #05

Find I_o using mesh analysis.



$$-6 + 5000(I_o - I_1) + 5000(I_o - I_2) = 0 \qquad \text{(mesh 0)}$$

$$5000(I_1 - I_o) + 10000\,I_1 + 6 = 0 \qquad \text{(mesh 1)}$$

$$5000(I_2 - I_o) - 6 + 5000\,I_2 = 0 \qquad \text{(mesh 2)}$$

In matrix form:

$$\begin{bmatrix} 10000 & -5000 & -5000 \\ -5000 & 15000 & 0 \\ -5000 & 0 & 10000 \end{bmatrix} \begin{bmatrix} I_o \\ I_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} 6 \\ -6 \\ 6 \end{bmatrix}$$

Solving yields $I_o = 1.2$ mA