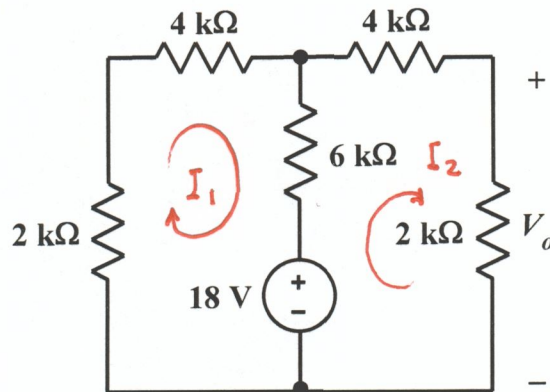


EE 2240  
Problem #01



- a. How many equations are necessary to analyze this circuit by the mesh analysis method?

2

Use the method discussed in class to:

- b. Develop the mesh equations describing the circuit.

$$\begin{aligned} 2000 I_1 + 4000 I_1 + 6000 (I_1 - I_2) + 18 &= 0 \\ -18 + 6000 (I_2 - I_1) + 4000 I_2 + 2000 I_2 &= 0 \end{aligned}$$

- c. Write the mesh equations in the matrix form discussed in class.

$$\begin{bmatrix} 12000 & -6000 \\ -6000 & 12000 \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} -18 \\ 18 \end{bmatrix}$$

- d. Solve the mesh equations.

$$I_1 = -1 \text{ mA} \quad I_2 = 1 \text{ mA}$$

- e. Use Ohm's Law to determine the value of  $V_o$ .

$$V_o = (2 \text{ k}\Omega) I_2 = 2 \text{ V}$$