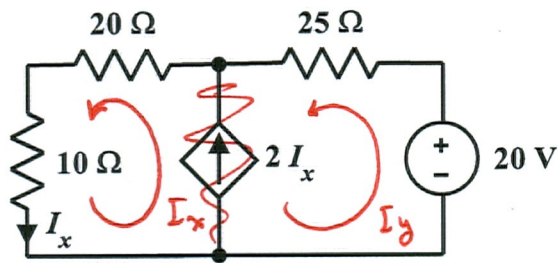


EE/EET 2240  
Homework Problem #19

Use the mesh analysis method to determine  $I_x$ .



$$I_x - I_y = 2I_x \quad (\text{constraint equation})$$

$$(20\Omega)I_x + (10\Omega)(I_x) - 20V + (25\Omega)I_y = 0 \quad (\text{KVL for the supermesh})$$

In matrix form:

$$\begin{bmatrix} -1 & -1 \\ 30 & 25 \end{bmatrix} \begin{bmatrix} I_x \\ I_y \end{bmatrix} = \begin{bmatrix} 0 \\ 20 \end{bmatrix}$$

Solving yields:

$$I_x = 4A$$

$$I_y = -4A$$