ECE 1270
Su 08

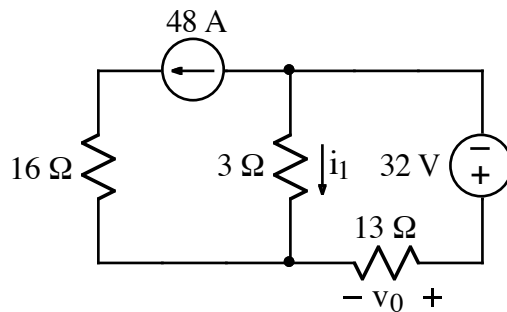**HOMEWORK #7 solution**

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Ex:

Use the node-voltage method to find i_1 and v_0.

sol'n: We sum currents out of v_1 node:

$$48A + \frac{v_1 - 0V}{3\,\Omega} + \frac{(v_1 + 32V) - 0V}{13\,\Omega} = 0V$$

$$v_1 \left(\frac{1}{3\,\Omega} + \frac{1}{13\,\Omega} \right) = -48A - \frac{32V}{13\,\Omega}$$

Multiply both sides by $39\,\Omega$:

$$v_1 \left(13 + 3 \right) = -48A \cdot 39\,\Omega - 32V(3)$$

$$v_1 \cdot 16 = -48(39)V - 3(32)V$$

$$v_1 = -3(39) - 2(3)$$

$$v_1 = -123V$$

$$v_0 = v_1 + 32V = -91V$$

$$i_1 = \frac{v_1}{3\,\Omega} = \frac{-123V}{3\,\Omega} = -41A$$