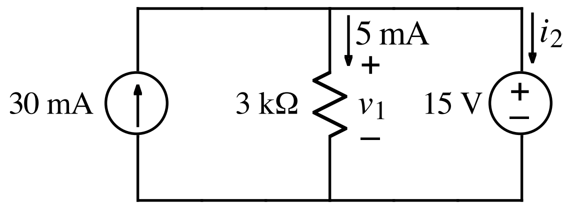
Ex:



Use Kirchhoff's laws to find the value of v_1 and i_2.

SOL'N: A voltage loop on the right side yields the value of v_1:

$$v_1 - 15 \text{ V} = 0 \text{ V} \Rightarrow \text{v}_1 = 15 \text{ V}$$

Note that this loop proceeded in a clockwise direction, starting from the lower right. The sign of each voltage drop is determined by the + or – voltage symbol seen as the path exits a component.

A current sum at the top center node yields the value of i_2:

$$-30 \text{ mA} + 5 \text{ mA} + i_2 = 0 \text{ V} \Rightarrow i_2 = 25 \text{ mA}$$

Note that this is the sum of the currents flowing away from the top center node.

Note also that a current sum for the bottom center node yields the same value for i_2. This follows because the three currents are actually the same three currents flowing away from the top center node (but of the opposite sign).