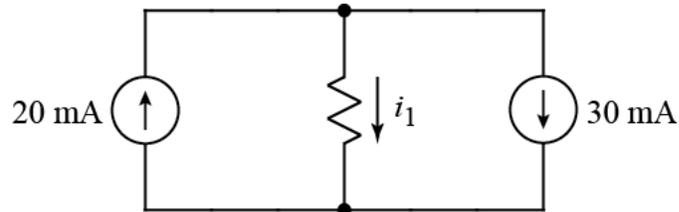


Ex:



Use Kirchhoff's laws to find the value of  $i_1$ .

SOL'N: A current sum at the top center (or, alternatively, bottom center) node yields the value of  $i_1$ :

$$20 \text{ mA} = i_1 + 30 \text{ mA} \Rightarrow i_1 = -10 \text{ mA}$$

Note that this summation is written as currents measured flowing into node equal the currents measured flowing out of the node. Another way to write the current summation is put all currents on one side of the equation, with  $-$  signs for currents flowing into node and  $+$  signs for current flowing out of the node:

$$-20 \text{ mA} + i_1 + 30 \text{ mA} = 0 \text{ A} \Rightarrow i_1 = -10 \text{ mA}$$

Note also that a current sum for the bottom center node yields the same value for  $i_1$ . This follows because the three currents are actually the same as the three currents flowing away from the top center node (but of the opposite sign).