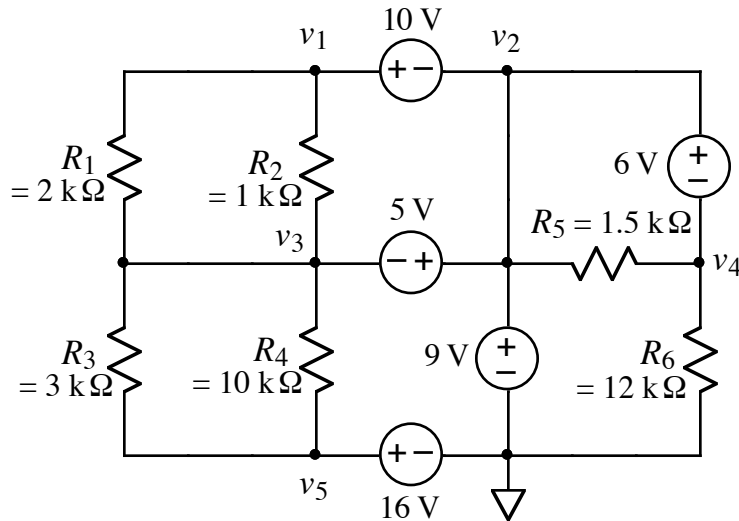


Ex:



Find the absolute voltages at all the labeled nodes in the above circuit.

SOL'N:

Starting at the reference node, we step by values of voltage sources that connect nodes.

Note: The difference in absolute voltage between two nodes is equal to a voltage source value if there is only a voltage source between the nodes. If there is also a resistor in series with the voltage source, the difference in the node voltages is typically not equal to the voltage source value. (The exception would be the rare case when the current in the resistor is equal to zero.

Here, every nodes happens to be connected to another node by a voltage source, (without a series resistor).

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Thus,  $V_5 = 16V$ , owing to the 16V source.

We also observe that nodes connected by wires are really a single node. Thus, the node above the 9V source is  $V_2$ .

$$V_2 = 9V$$

From the  $V_2$  node, we step to the remaining nodes:

$$V_3 = 9V - 5V = 4V$$

$$V_1 = 9V + 10V = 19V$$

$$V_4 = 9V - 6V = 3V$$