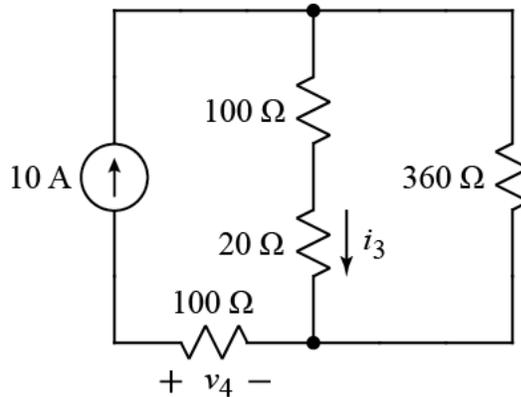


Ex:Calculate i_3 and v_4 .

SOL'N: a) The total current of 10 A flows through the parallel combination of the center resistors (that total 120 Ω) and the 360 Ω . Thus, this circuit has a current divider consisting of the 10 A source, 120 Ω in the center and the 360 Ω on the right. Current i_3 is the same as the current throughout the center branch, as given by the current divider formula:

$$i_3 = 10 \text{ A} \cdot \frac{\frac{1}{120 \Omega}}{\frac{1}{120 \Omega} + \frac{1}{360 \Omega}}$$

or, after multiplying top and bottom by 360 Ω :

$$i_3 = 10 \text{ A} \cdot \frac{3}{3+1} = 7.5 \text{ A}$$

To find v_4 , we observe that the entire 10 A from the source flows through the 100 Ω resistor on the bottom, but if we follow the arrow around the circuit, we find that it points in the opposite direction of the passive sign convention. This direction conflict introduces a minus sign in Ohm's law:

$$v_4 = -10 \text{ A} \cdot 100 \Omega = -1 \text{ kV}$$