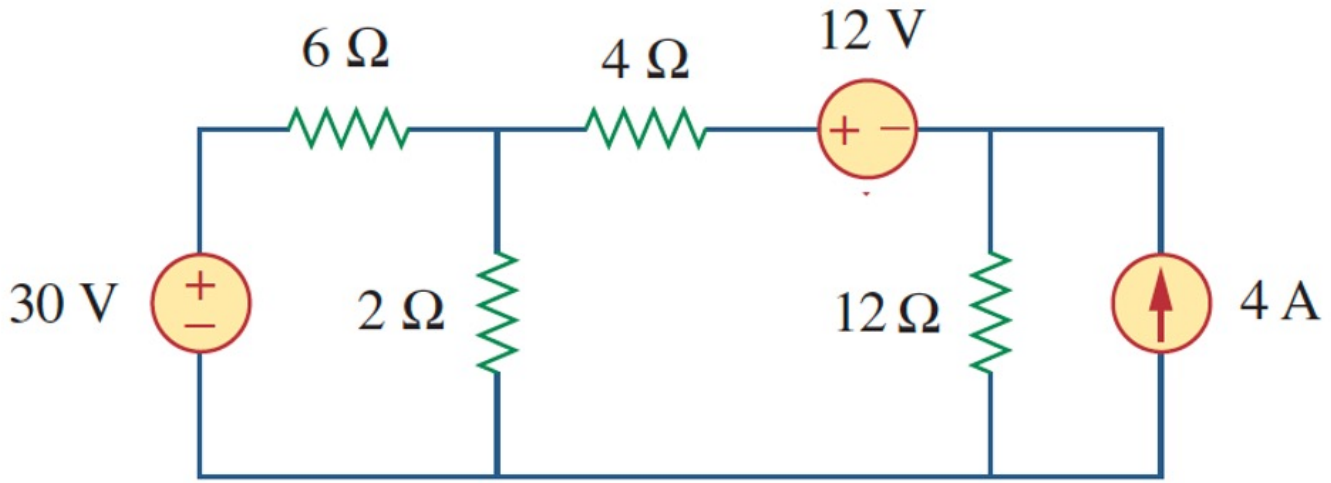
Node – 2

more complex branches

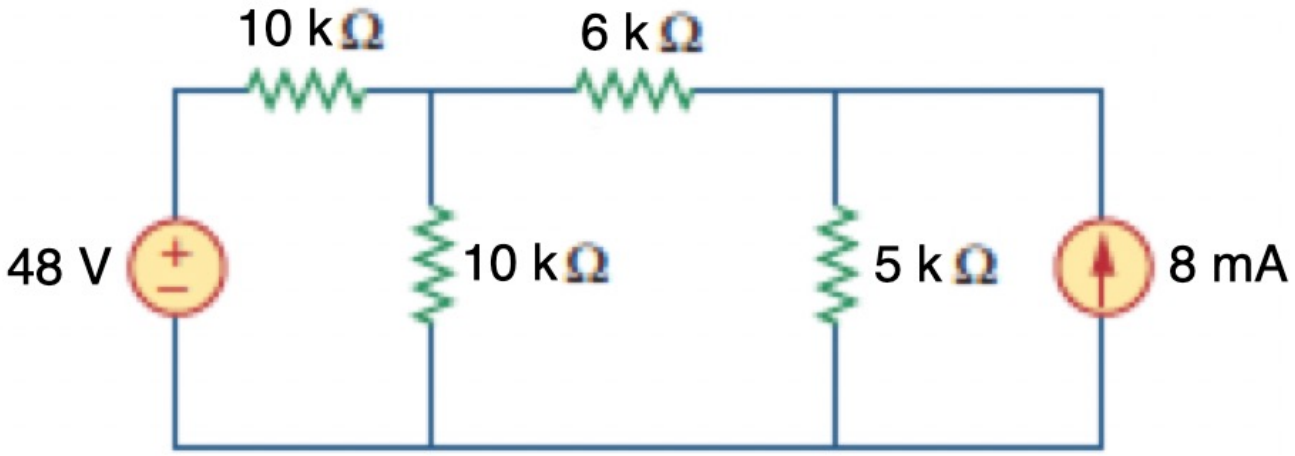
Extension #2 – V + R branches

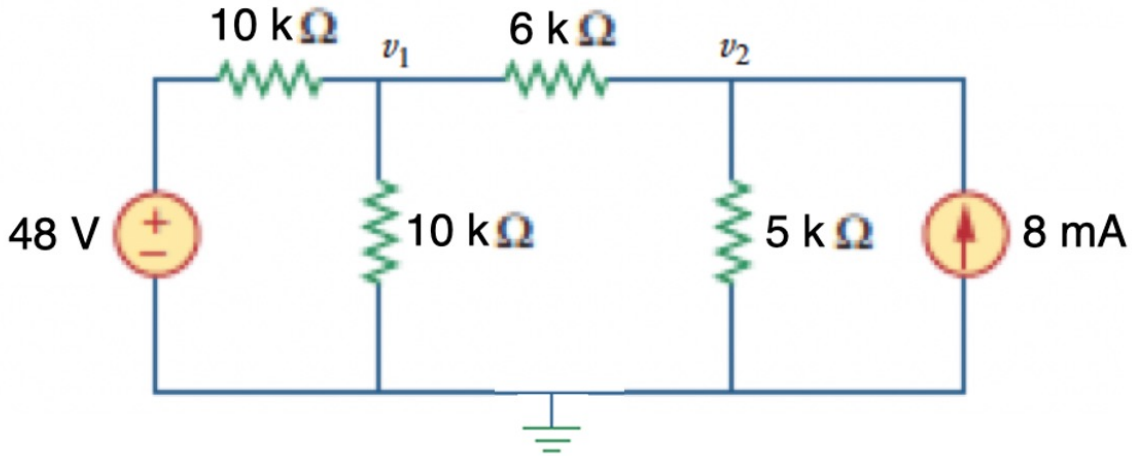
- Consider:



- Solution: Modify the Ohm's Law expression(s) for the individual branch current(s)

Example (solved on next slide)





$$\frac{v_1}{10k} + \frac{v_1 - 48}{10k} + \frac{v_1 - v_2}{6k} = 0$$

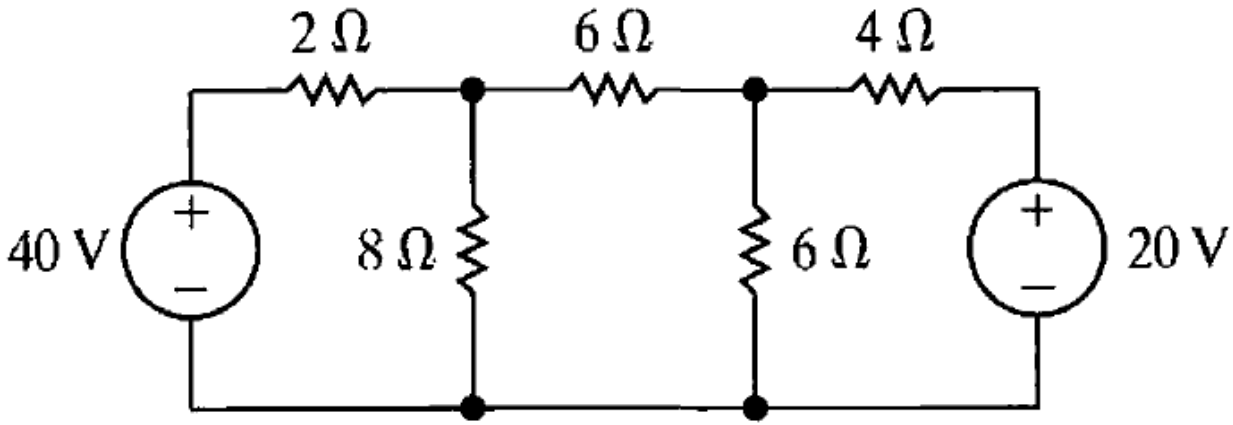
$$\frac{v_2}{5k} + \frac{v_2 - v_1}{6k} - .008 = 0$$

$$3v_1 + 3v_1 + 5v_1 - 5v_2 = 144$$

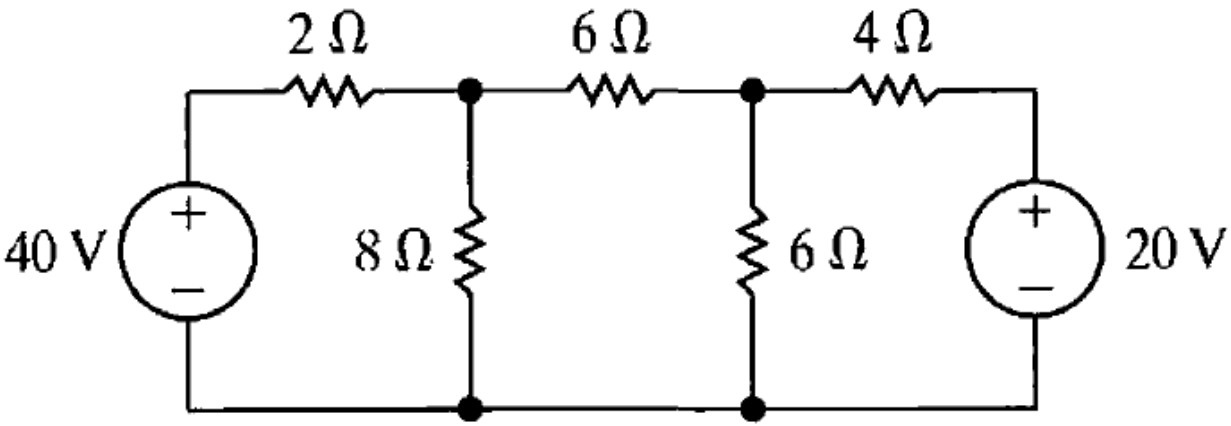
$$6v_2 + 5v_2 - 5v_1 = 240$$

$$\begin{aligned} 11v_1 - 5v_2 &= 288 \\ -5v_1 + 11v_2 &= 240 \end{aligned} \Rightarrow \begin{aligned} v_1 &= 29\ V \\ v_2 &= 35\ V \end{aligned}$$

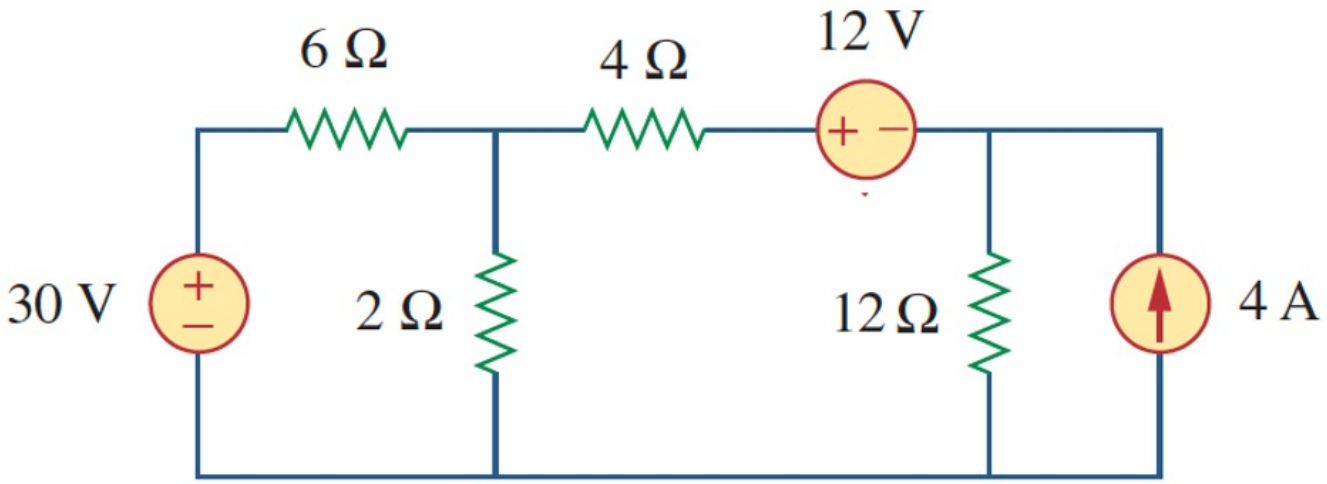
Example



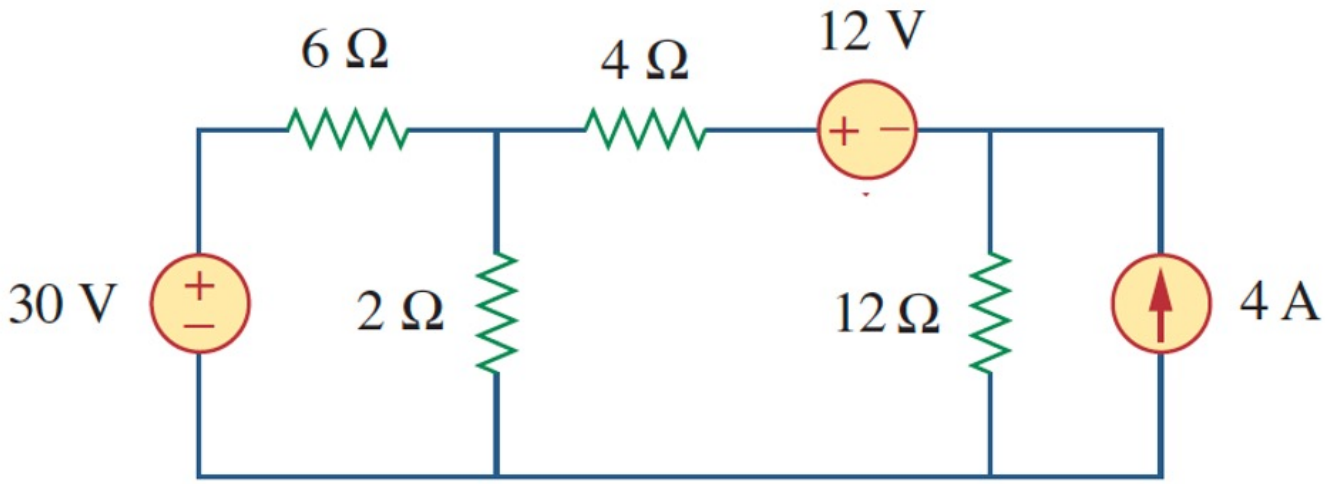
$28\ V, 16\ V$



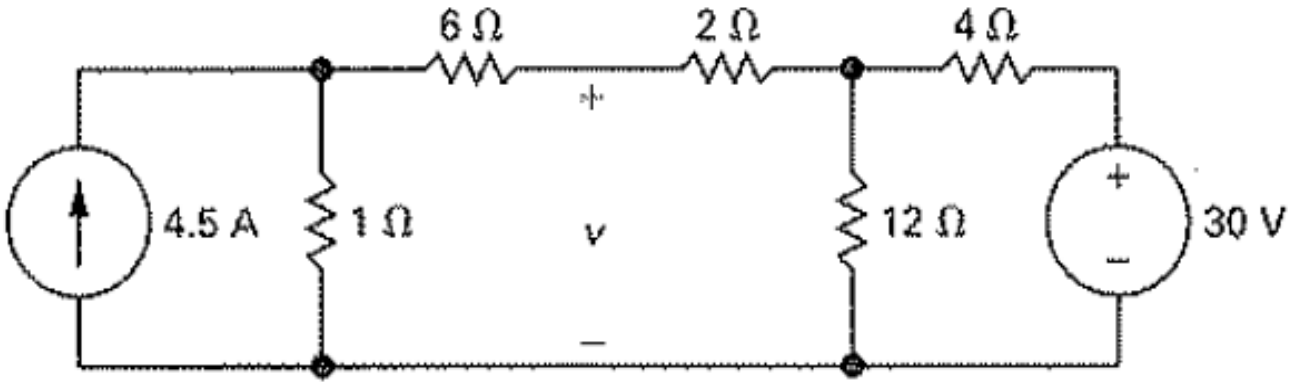
Example: find the power of the current source



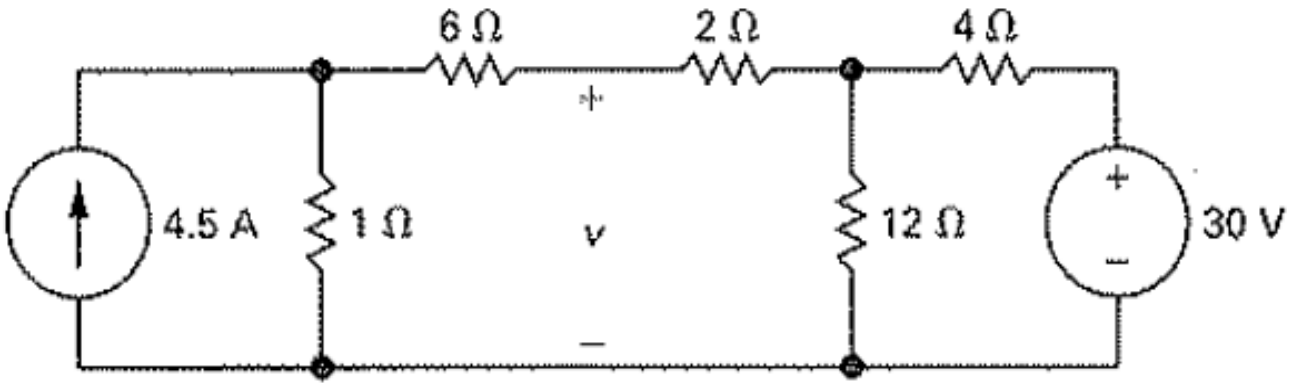
$-48\ W$



Example: find v

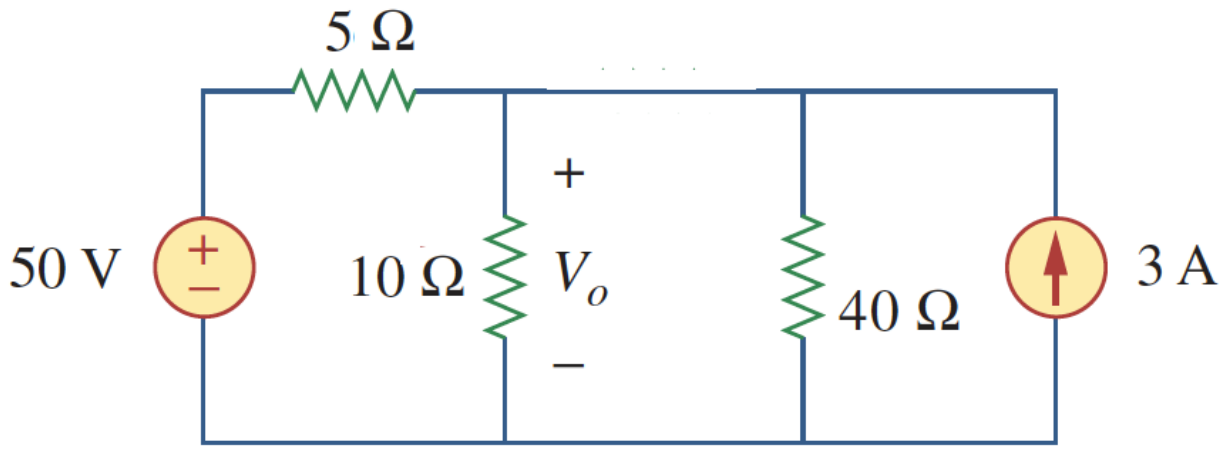


$15\ V$



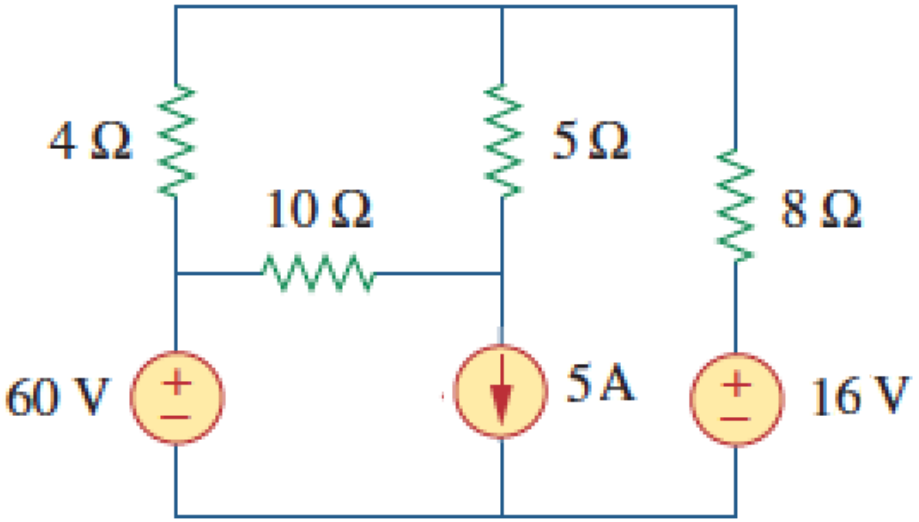
$40\ V$

Practice problem: find V_o



$v_T = 40\ V, v_M = 30\ V$

Practice problem: find the node voltages to the top and bottom of the 5 Ω resistor relative to the bottom



$-46\ A$

Practice problem: find i_o