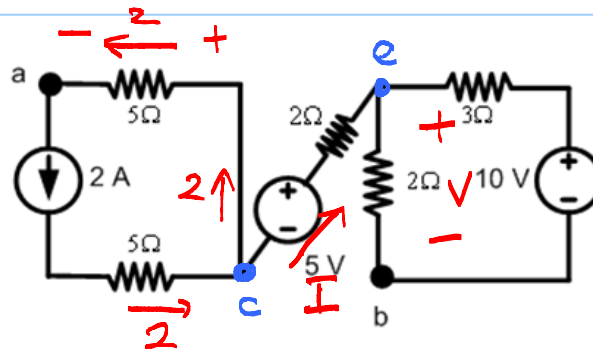
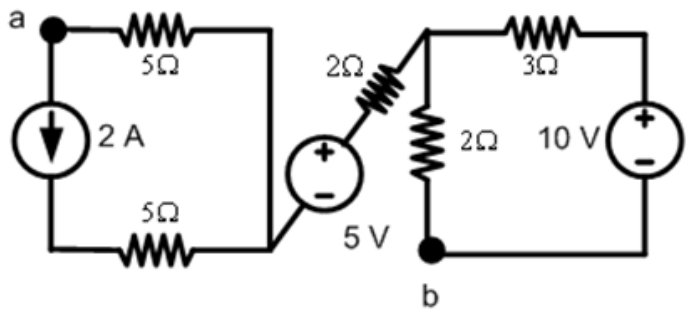


①

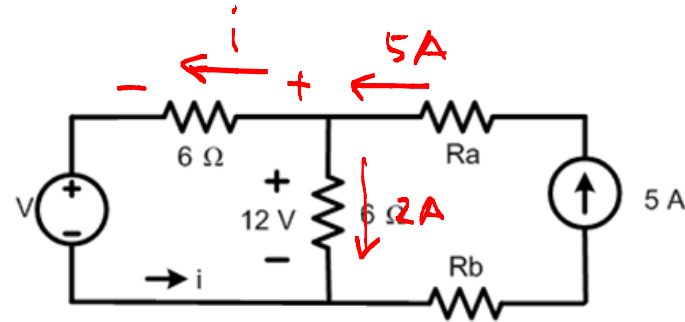
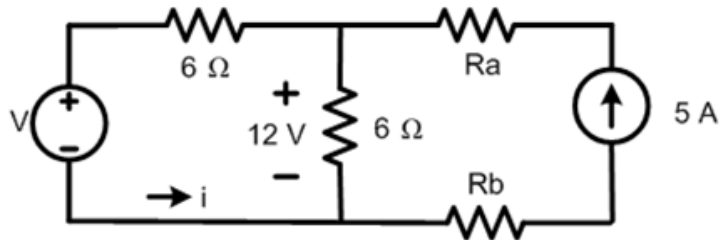


$$\begin{aligned}\sum I &= 0 \\ I + 2 &= 2 \\ I &= 0\end{aligned}$$

$$V = \frac{2}{2+3} \times 10 = 4$$

$$\begin{aligned}V_{ab} &= V_{ac} + V_{ce} + V_{eb} \\ &= (-2 \times 5) - 5 + (2 \times I) + V \\ &= -10 - 5 + 2 \cdot 0 + 4 \\ &= \boxed{-11 \text{ V}}\end{aligned}$$

2



$$\begin{aligned}\sum I &= 0 \\ 5 &= i + 2 \\ i &= 3\text{A}\end{aligned}$$

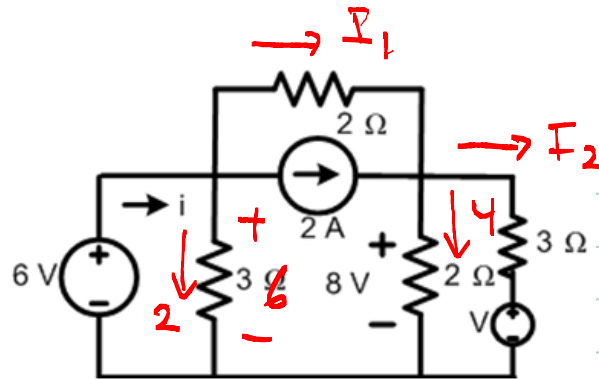
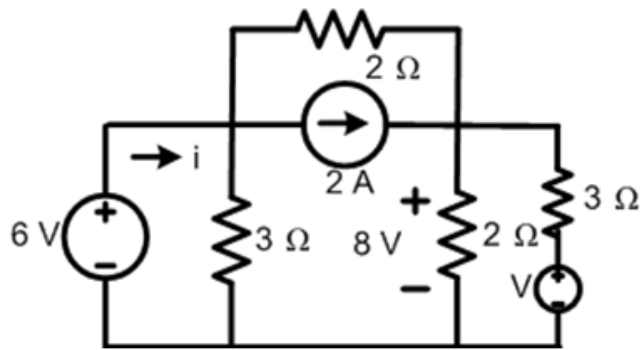
$$\sum V = 0$$

$$-V - (i \times 6) + 12 = 0$$

$$V = 12 - (i \times 6)$$

$$V = 12 - (3 \times 6) = 12 - 18 = -6\text{V}$$

3



$$\sum V = 0$$

$$-6 + 2I_1 + 8 = 0$$

$$I_1 = \frac{2}{-2} = -1$$

$$i - 4 = -1$$

$$i = 3A$$

$$\sum V = 0$$

$$3I_2 + V - 8 = 0$$

$$V = 8 - 3I_2 = 8 - 3(i - 6) = 8 - 3(3 - 6)$$

$$V = 8 + 9 = 17V$$

$$\sum I = 0$$

$$i = 2 + 2 + I_1$$

$$I_1 = (i - 4)$$

$$\sum I = 0$$

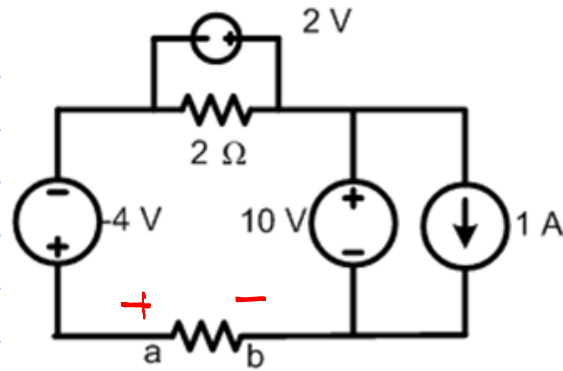
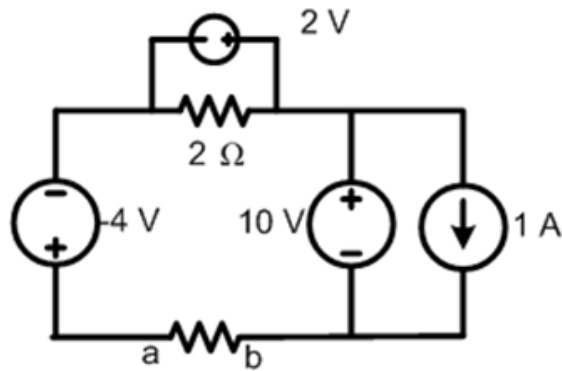
$$I_1 + 2 = I_2 + 4$$

$$I_2 = I_1 + 2 - 4$$

$$I_2 = (i - 4) - 2$$

$$I_2 = (i - 6)$$

4

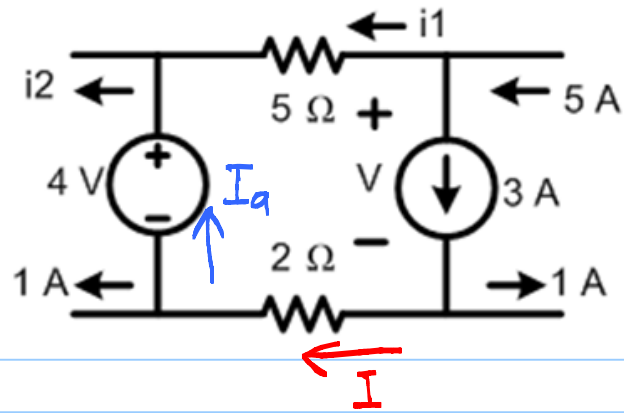
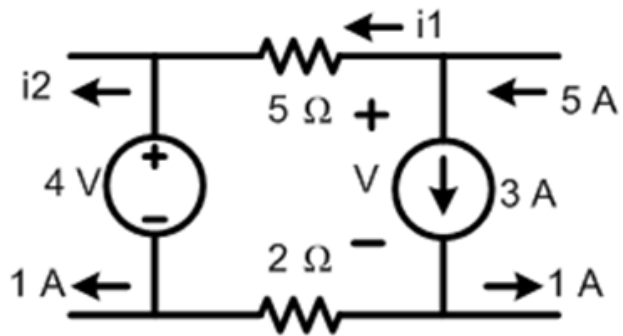


$$\sum V = 0$$

$$V_{ab} - 10 + 2 - (-4) = 0$$

$$V_{ab} = 10 - 2 - 4 = \textcircled{4V}$$

5



$$\sum I = 0$$

$$3 = 1 + I$$

$$I = 2A$$

$$\sum I = 0$$

$$I = I_q + 1$$

$$I_q = 2 - 1 = 1A$$

$$\sum I = 0$$

$$5 = i_1 + 3$$

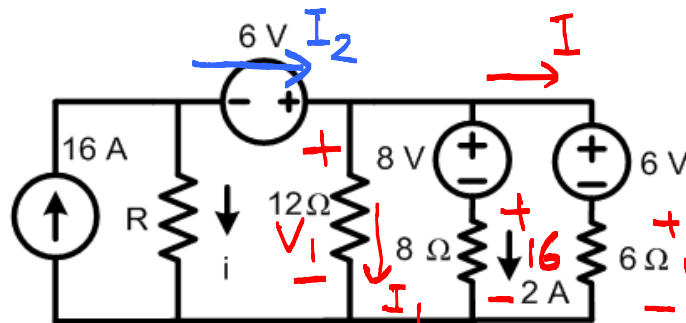
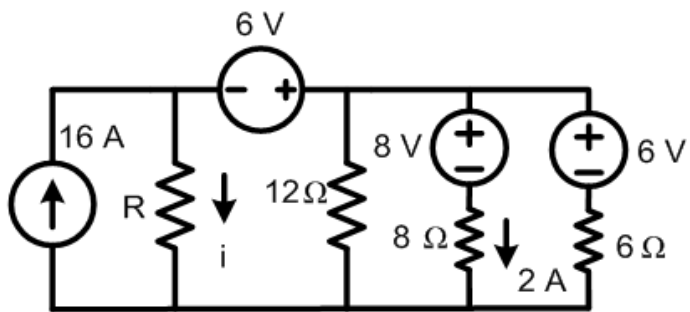
$$i_1 = 5 - 3 = 2A$$

$$\sum I = 0$$

$$i_2 = i_1 + I_q = 2 + 1$$

$$i_2 = 3A$$

6



$$\sum V = 0$$

$$-16 - 8 + 6 + V = 0$$

$$V = 18 \text{ V}$$

$$I = \frac{18}{6} = 3 \text{ A}$$

$$\sum V = 0$$

$$-V_1 + 8 + 16 = 0$$

$$V_1 = 24 \text{ V}$$

$$I_1 = \frac{24}{8} = 3 \text{ A}$$

$$\sum I = 0$$

$$I_2 = I_1 + 2 + I = 3 + 2 + 3 = 8 \text{ A}$$

$$\sum I = 0$$

$$16 = i + I_2$$

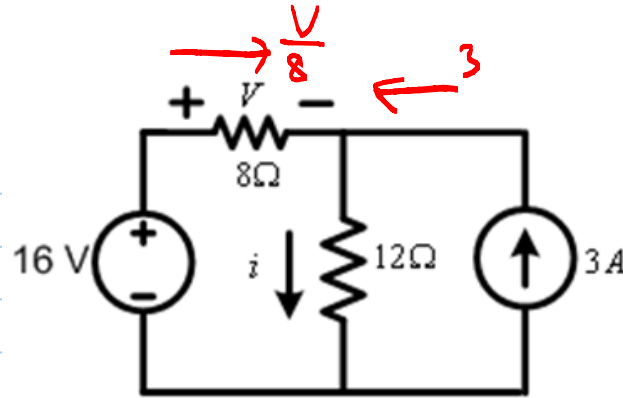
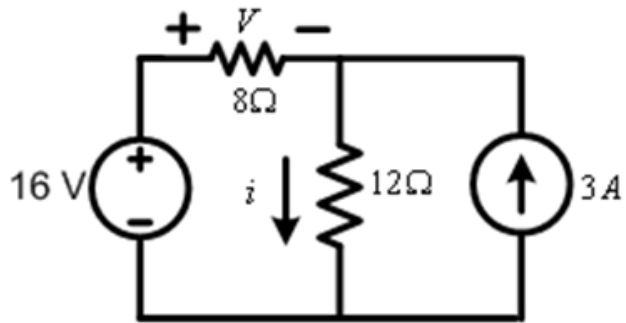
$$i = 16 - I_2 = 16 - 8 = 8 \text{ A}$$

$$\sum V = 0$$

$$-6 + V_1 - iR = 0$$

$$R = \frac{V_1 - 6}{i} = \frac{24 - 6}{8} = \frac{18}{8} = \frac{9}{4} \Omega$$

7



$$i = \frac{V}{8} + 3$$

$$i = \frac{16}{8} + 3 = 2A$$

$$\sum I = 0$$

$$i = \frac{V}{8} + 3$$

$$\sum V = 0$$

$$-16 + V + 12i = 0$$

$$-16 + V + 12\left(\frac{V}{8} + 3\right) = 0$$

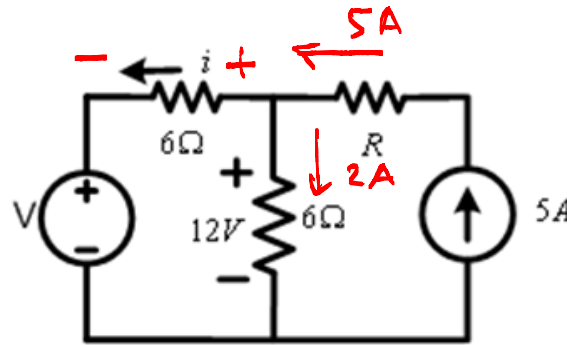
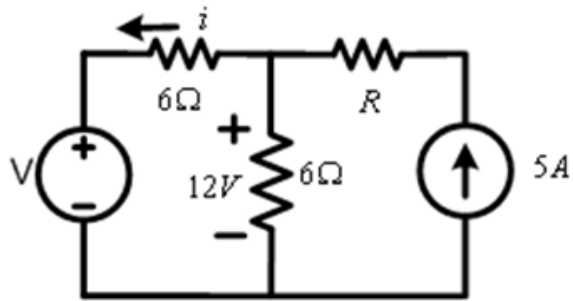
$$-16 + V + \frac{12V}{8} + 36 = 0$$

$$-128 + 8V + 12V + 288 = 0$$

$$20V + 160 = 0$$

$$V = -\frac{160}{20} = -8V$$

8



$$\sum i = 0$$

$$5 = i + 2$$

$$i = 5 - 2 = 3A$$

$$\sum V = 0$$

$$-V - 6i + 12 = 0$$

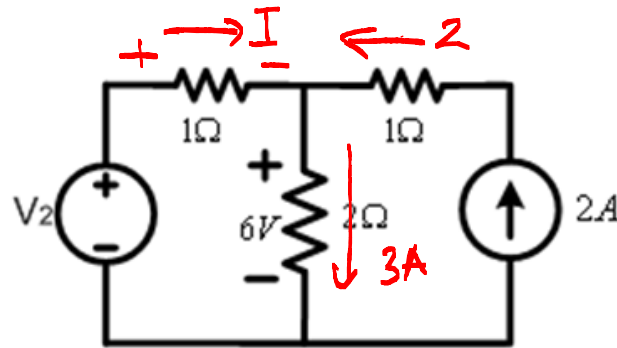
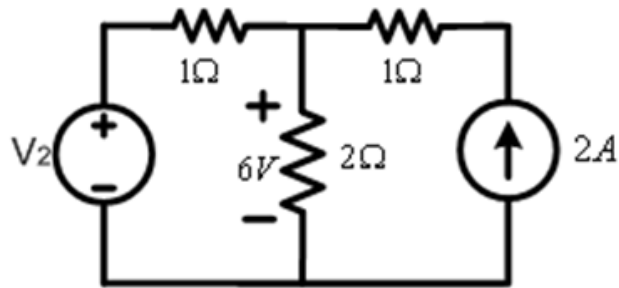
$$V = 12 - 6i$$

$$V = 12 - (6 \times 3) = 12 - 18$$

$$V = \boxed{-6V}$$



9



$$\sum I = 0$$

$$I + 2 = 3$$

$$I = 3 - 2 = 1A$$

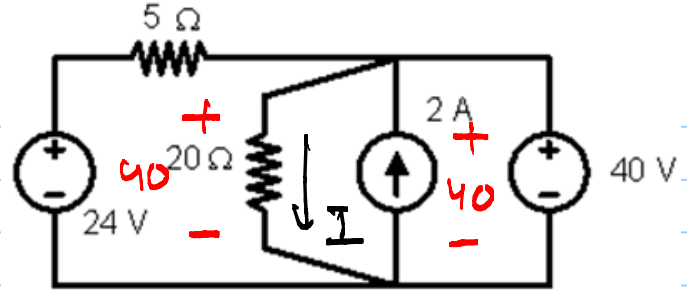
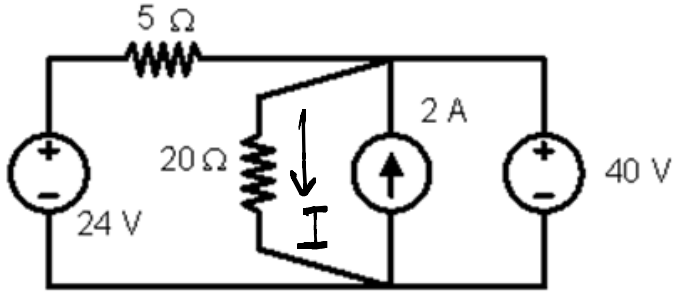
$$\sum V = 0$$

$$-V_2 + 1I + 6 = 0$$

$$V_2 = 6 + 1 \cdot I = 6 + 1$$

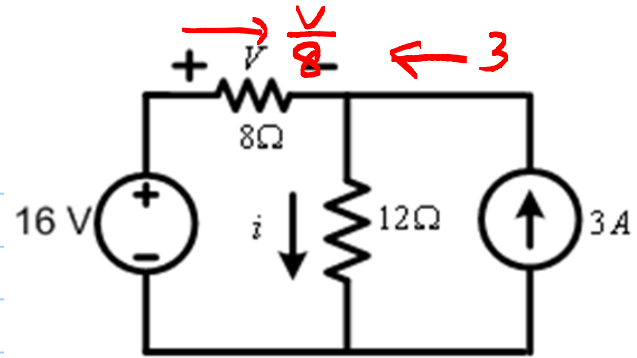
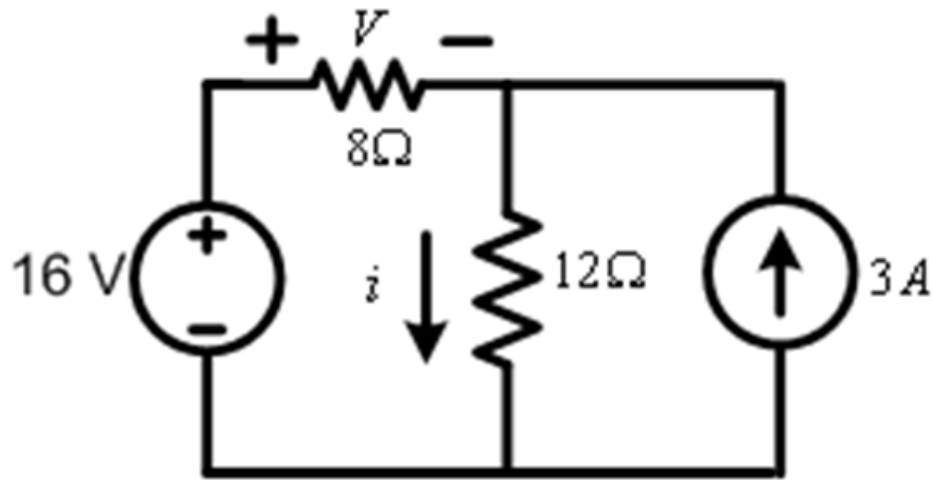
$$V_2 = 7V$$

10



$$I = \frac{40}{20} = 2A$$

11



$$\Sigma I = 0$$

$$i = \frac{V}{8} + 3$$

$$\Sigma V = 0$$

$$-16 + V + 12i = 0$$

$$-16 + V + 12\left(\frac{V}{8} + 3\right) = 0$$

$$-16 + V + \frac{12V}{8} + 36 = 0$$

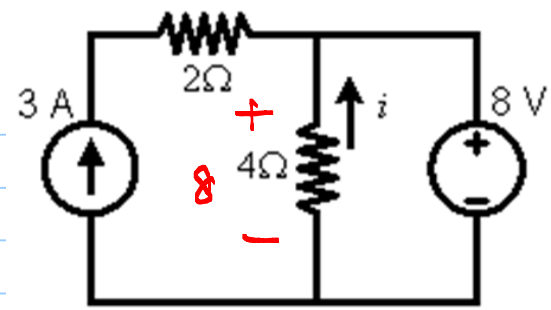
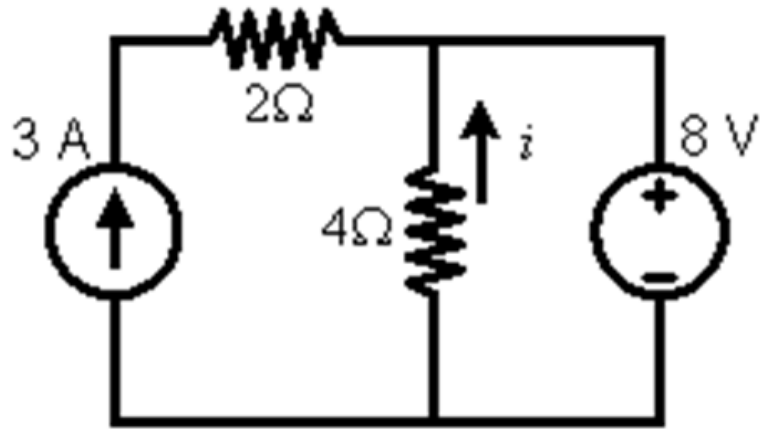
$$-128 + 8V + 12V + 288 = 0$$

$$20V + 160 = 0$$

$$V = -8V$$

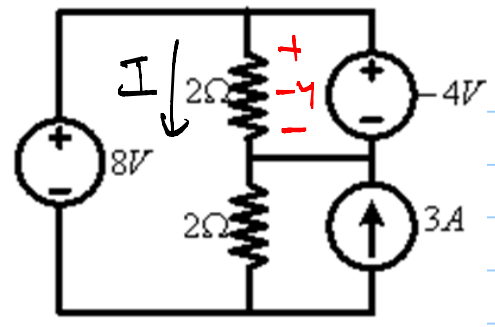
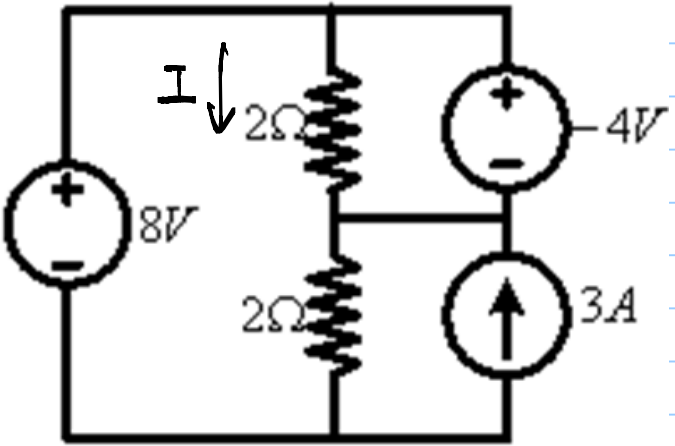
$$i = \frac{V}{8} + 3 = -1 + 3 = 2A$$

12



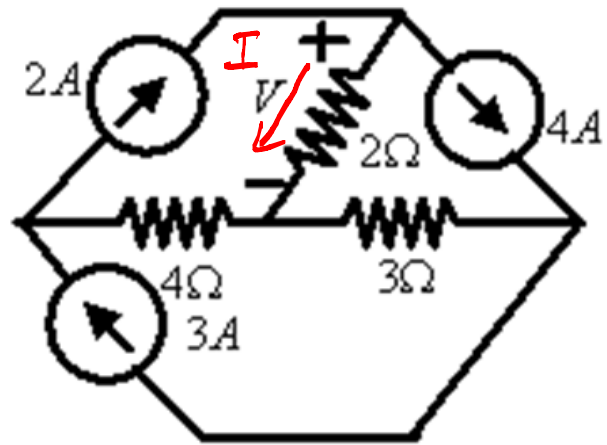
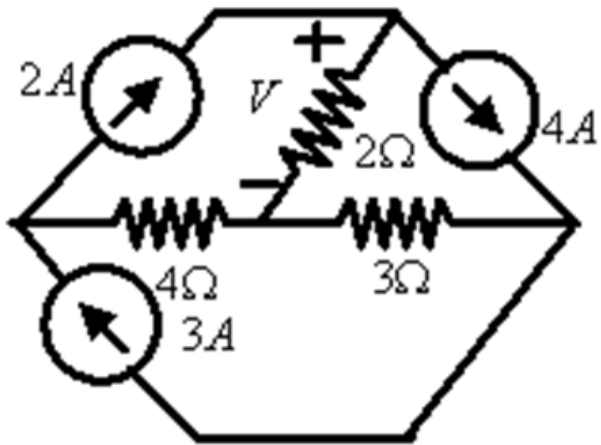
$$i = \frac{8}{4} = 2 \text{ A}$$

3



$$I = \frac{-4}{2} = -2A$$

14



$$\sum I = 0$$

$$2 = I + 4$$

$$I = -2A$$

$$V = 2I = 2 \times (-2)$$

$$V = -4V$$

