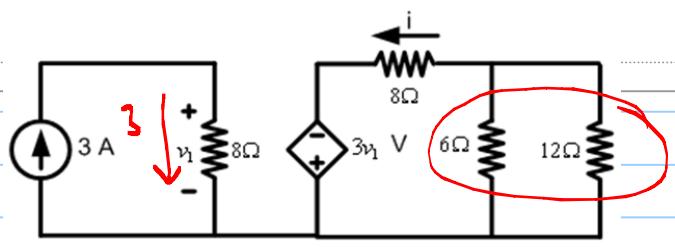
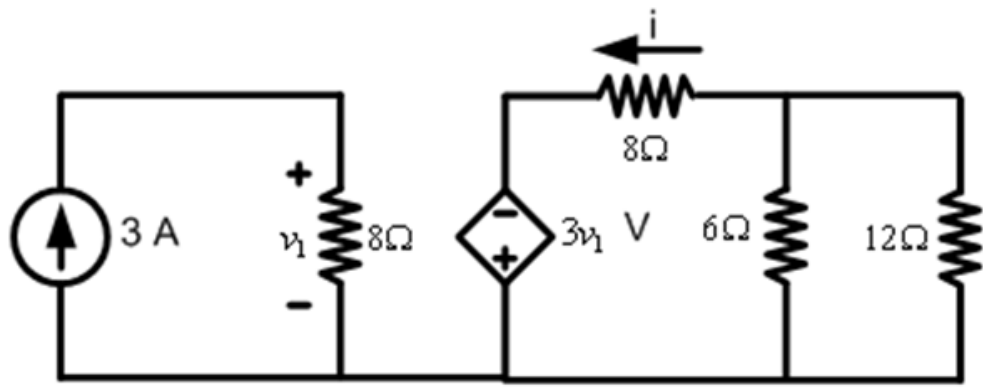
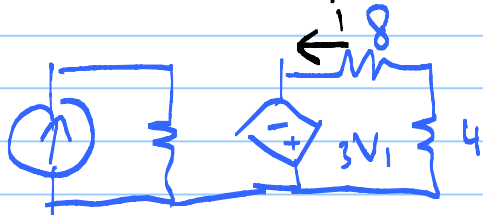


1



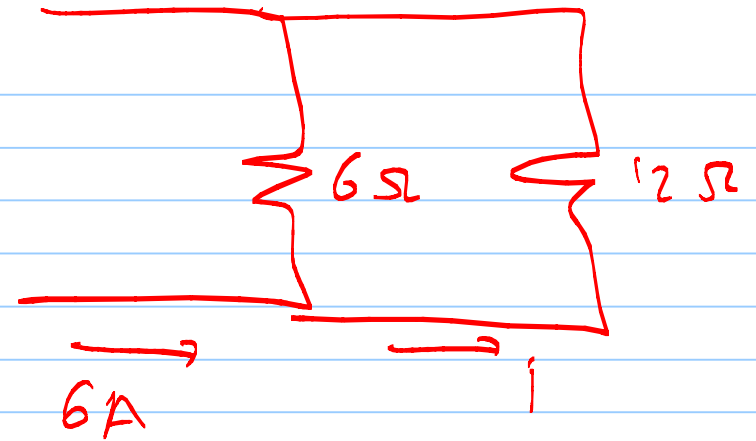
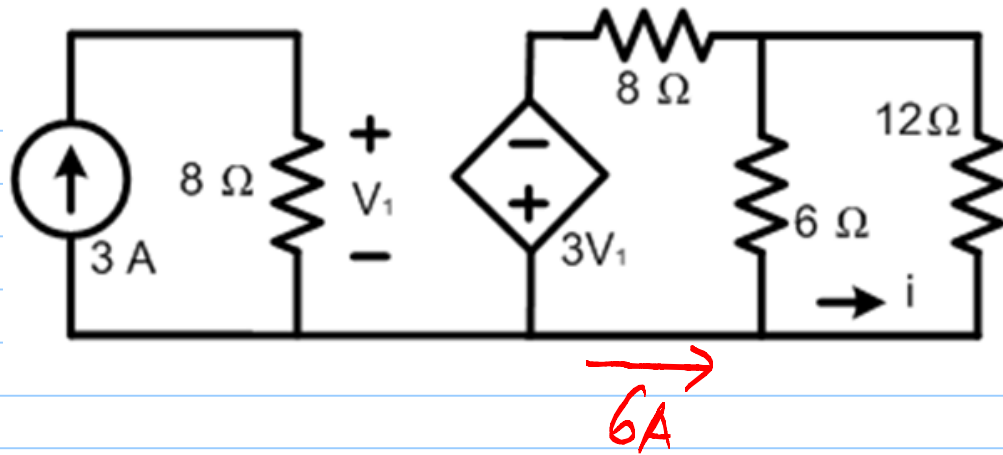
$$R_p = \frac{6 \times 12}{6 + 12}$$
$$R_p = 4 \Omega$$

$$V_1 = 8 \times 3 = 24 \text{ V}$$



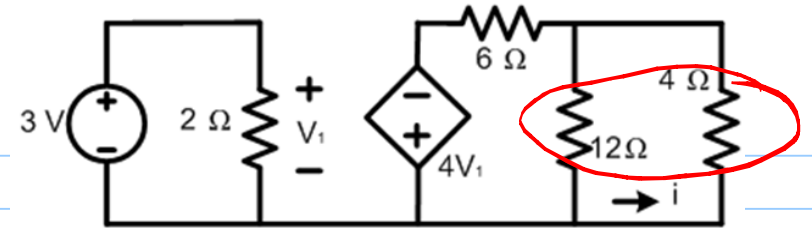
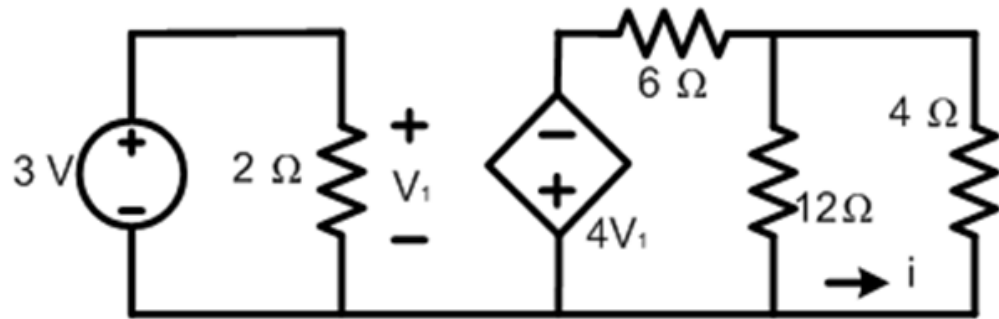
$$i = \frac{3V_1}{8 + 4} = \frac{3 \times 24}{12} = 6 \text{ A}$$

2

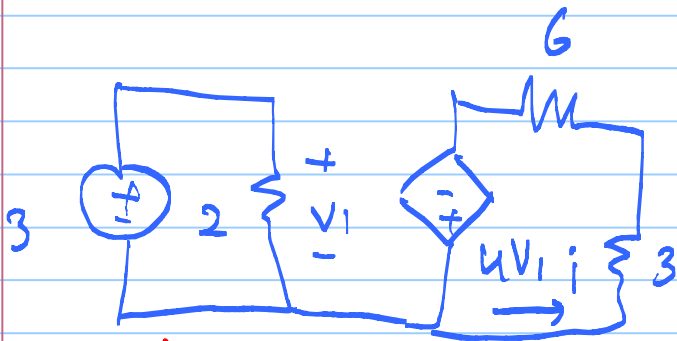


$$i = \frac{6}{6+12} \times 6$$
$$= \frac{6}{18} \times 6 = 2A$$

3



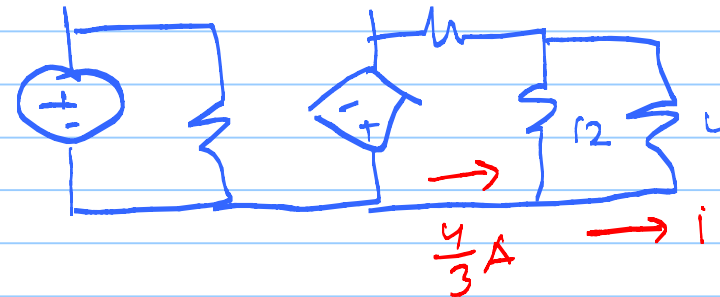
$$R_p = \frac{12 \times 4}{12 + 4} = \frac{12 \times 4}{16} = 3$$



$$V_1 = 3V$$

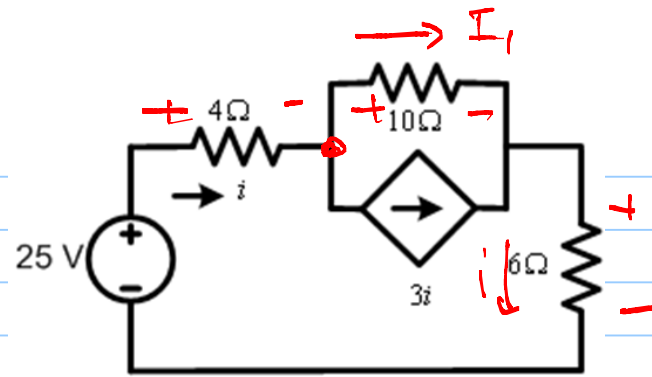
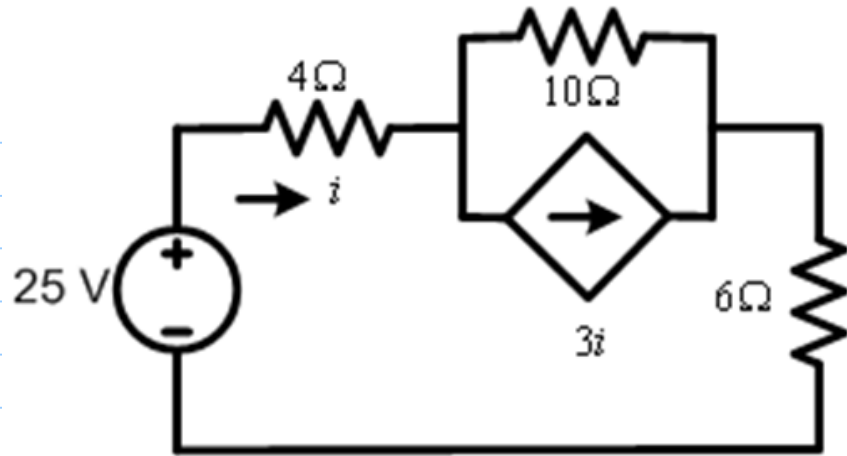
$$i = \frac{4V_1}{6+3} = \frac{4 \times 3}{9} = \frac{4}{3} A$$

⇒



$$i = \frac{12 \times 4}{12 + 4} \times \frac{4}{3} = 1A$$

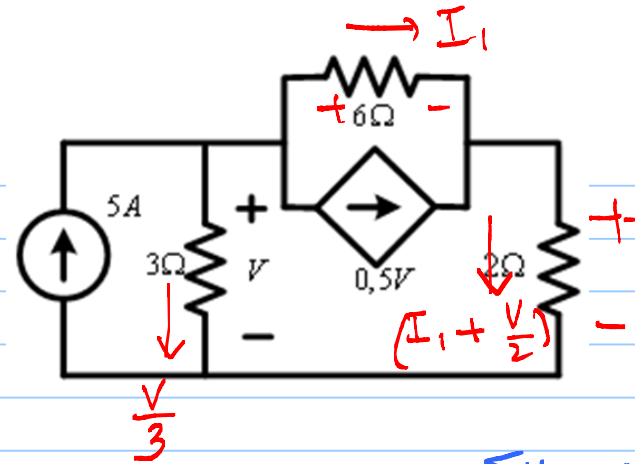
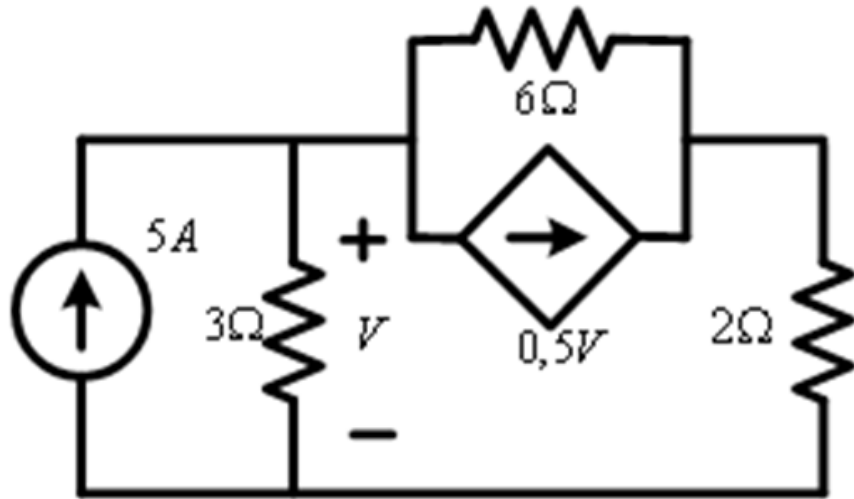
5



$$\begin{aligned}\sum I &= 0 \\ i &= I_1 + 3i \\ I_1 &= -2i\end{aligned}$$

$$\begin{aligned}\sum V &= 0 \\ -25 + 4i + 10I_1 + 6i &= 0 \\ -25 + 4i - 20i + 6i &= 0 \\ i &= \frac{-25}{10} = -2,5A\end{aligned}$$

5



$$\sum I = 0$$

$$5 = \frac{V}{3} + I_1 + \frac{V}{2}$$

$$I_1 = 5 - \frac{V}{3} - \frac{V}{2}$$

$$I_1 = \left(5 - \frac{5V}{6}\right)$$

$$\sum V = 0$$

$$6I_1 + 2\left(I_1 + \frac{V}{2}\right) - V = 0$$

$$6I_1 + 2I_1 + \cancel{V} - V = 0$$

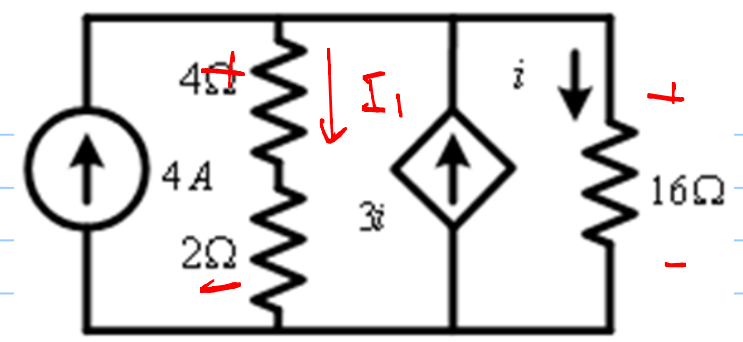
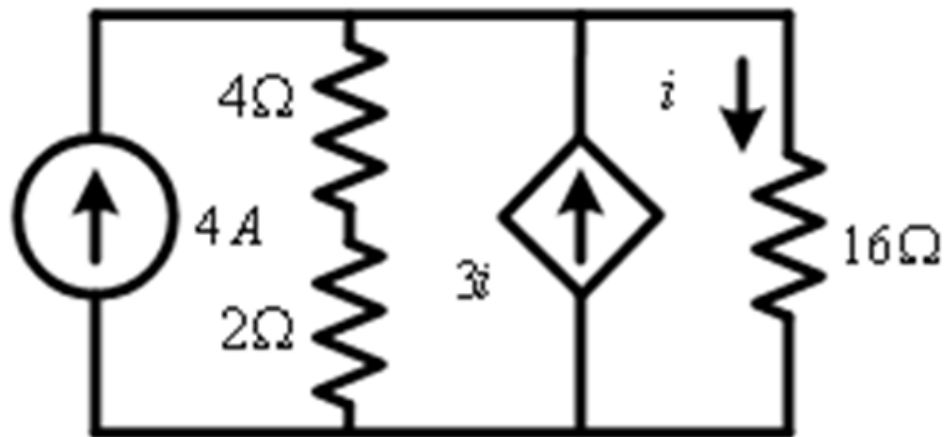
$$8I_1 = 0$$

$$I_1 = 0$$

$$I_1 = 5 - \frac{5V}{6} = 0$$

$$V = 6V$$

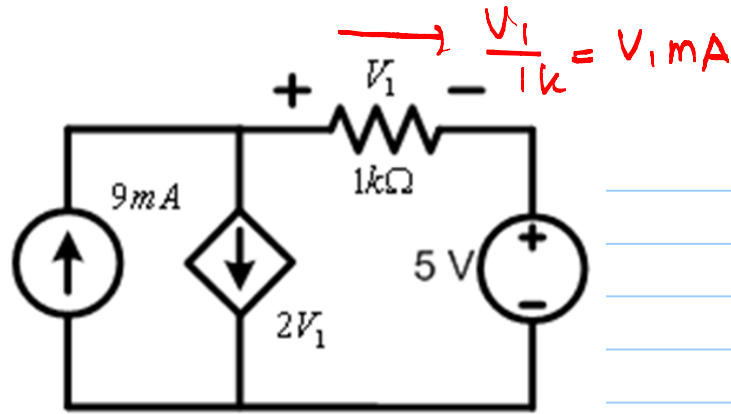
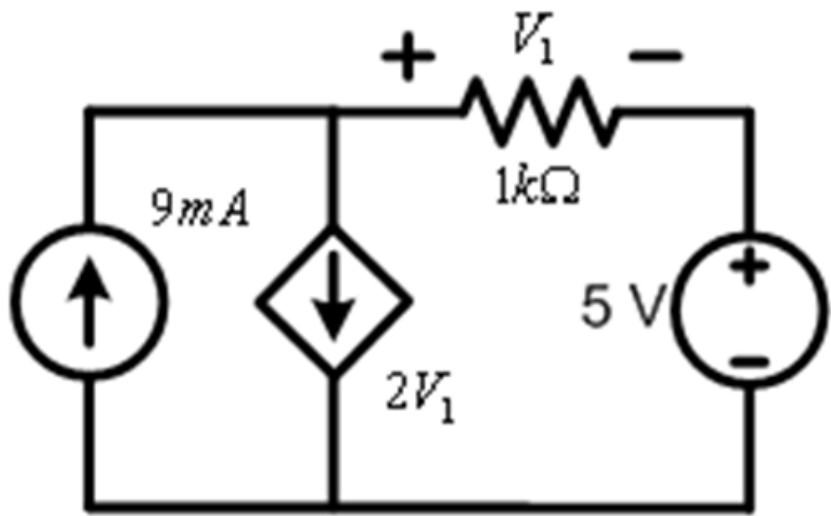
6



$$\Sigma I = 0$$
$$4 + 3i = I_1 + i$$
$$I_1 = 4 + 2i$$

$$\Sigma V = 0$$
$$-16i + 4I_1 + 2I_1 = 0$$
$$-16i + 6I_1 = 0$$
$$-16i + 6(4 + 2i) = 0$$
$$-16i + 24 + 12i = 0$$
$$-4i + 24 = 0$$
$$i = 6A$$

7

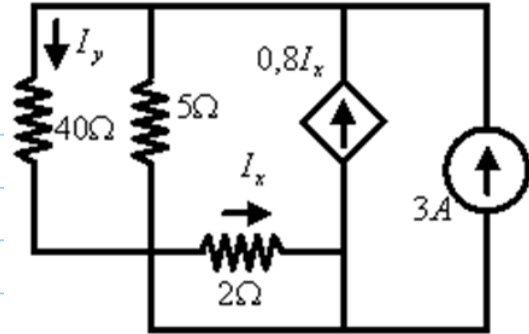
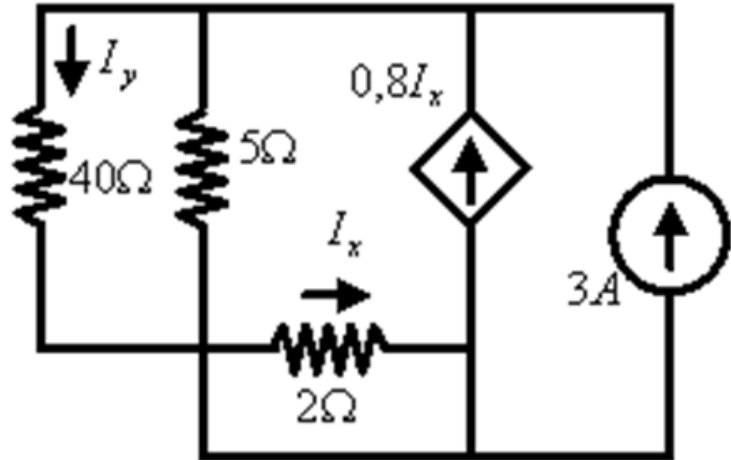


$$\sum I = 0$$

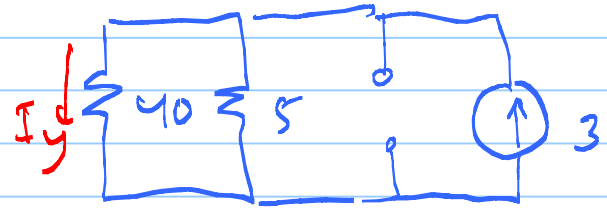
$$9 \text{ mA} = 2V_1 \text{ mA} + V_1 \text{ mA}$$

$$V_1 = \frac{9}{3} = 3 \text{ V}$$

8



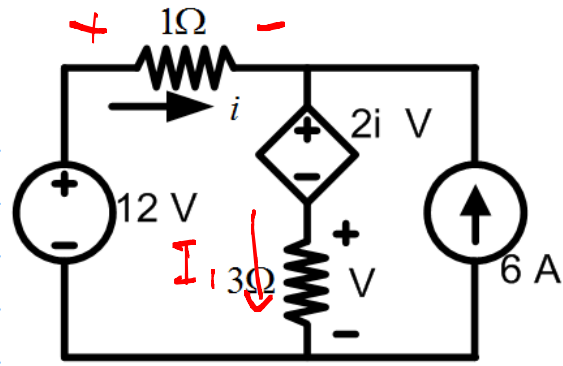
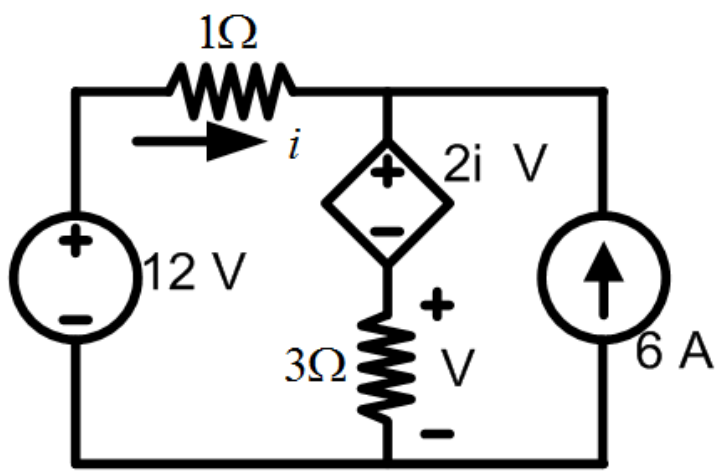
$I_x = 0$



$$I_y = \frac{5}{5+40} \times 3 = \frac{15}{45} = \frac{1}{3} \text{ A}$$



9



$$\sum I = 0$$

$$i + 6 = I_1$$

$$I_1 = i + 6$$

$$\sum V = 0$$

$$-12 + i + 2i + 3I_1 = 0$$

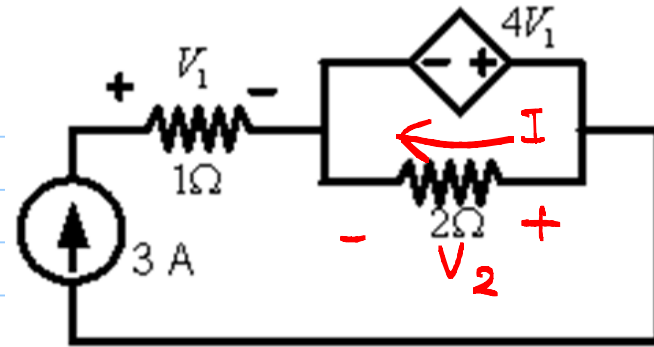
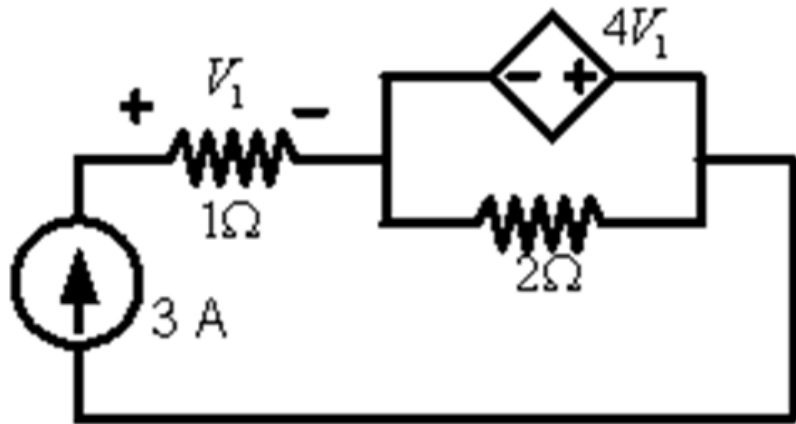
$$-12 + 3i + 3(i + 6) = 0$$

$$-12 + 3i + 3i + 18 = 0$$

$$+6 + 6i = 0$$

$$i = -1A$$

10

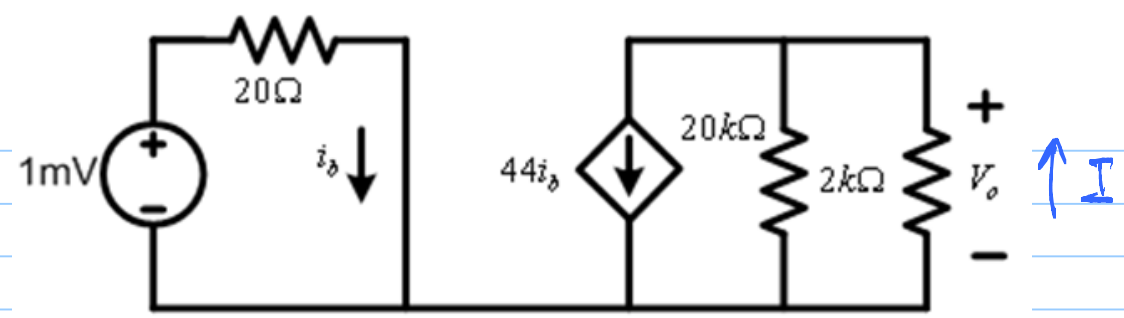


$$V_1 = 1 \times 3 = 3$$

$$V_2 = 4V_1 = 4 \times 3 = 12 \text{ V}$$

$$I = \frac{V_2}{2} = \frac{12}{2} = 6 \text{ A}$$

11



$$i_b = \frac{1\text{mV}}{20} = \frac{1}{20} \text{ mA}$$

$$\begin{aligned} I &= \frac{20\text{k}}{20\text{k} + 2\text{k}} \times 44 i_b \\ &= \frac{20\text{k}}{22\text{k}} \times 44 \cdot \frac{1}{20} \text{ mA} \\ &= 2 \text{ mA} \end{aligned}$$

$$V_o = 2\text{k} (-2\text{mA}) = -4\text{V}$$

