

$$V_{3\text{k}\Omega} = I_3 (3\text{k}\Omega) = \left(\frac{1}{2}\text{mA}\right)(3\text{k}\Omega) = 1.5\text{V}$$

$$\therefore V_b - V_a + V_{3\text{k}\Omega} = 0$$

$$V_b - 3 + 1.5 = 0 \quad \Rightarrow V_b = 1.5\text{V}$$

$$I_5 = \frac{V_b}{9\text{k} + 3\text{k}} = \frac{1.5}{12\text{k}} = \frac{1}{8}\text{mA}$$

$$V_c = I_5 (3\text{k}\Omega) = \frac{1}{8}\text{mA} (3\text{k}\Omega) = \frac{3}{8}\text{V}$$

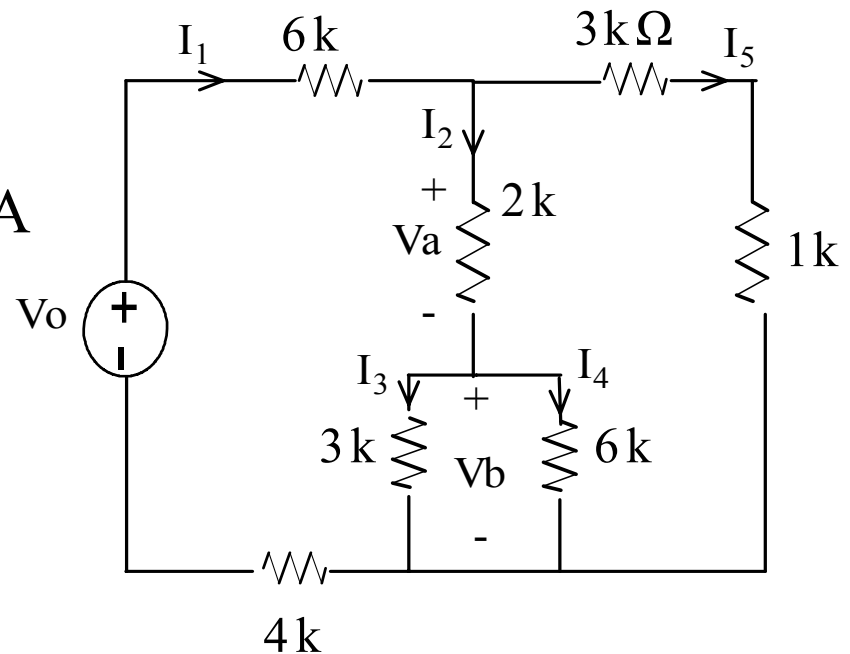
Example :

Find the source voltage V_o if $I_4 = 1/2 \text{ m A}$?

$$V_b = I_4 (6\text{k}) = \left(\frac{1}{2} \text{ m A}\right) (6 \text{ k } \Omega) = 3 \text{ V}$$

$$\therefore I_3 = \frac{V_b}{3\text{k}} = \frac{3}{3\text{k}} = 1 \text{ m A}$$

$$I_2 = I_3 + I_4 = 1 \text{ m A} + \frac{1}{2} \text{ m A} = 1.5 \text{ m A}$$



$$V_0 = (6\text{ k}\Omega) I_1 + V_a + V_b + 4\text{ k}(I_1) = 10\text{ k}(3\text{ m}) + 3 + 3$$

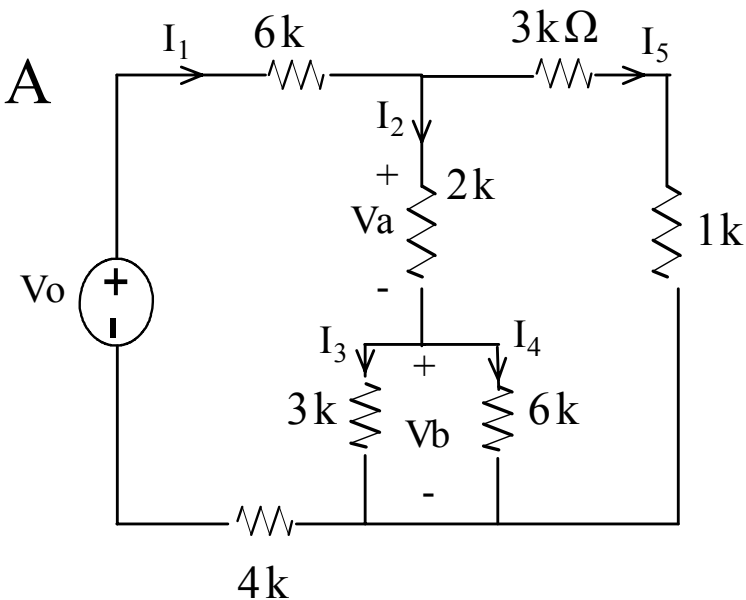
$$V_0 = 30 + 6 = 36$$

$$V_0 = 36\text{ V}$$

$$\therefore V_a = 2\text{ k}\Omega I_2 = (2\text{ k})(1.5\text{ m}) = 3\text{ V}$$

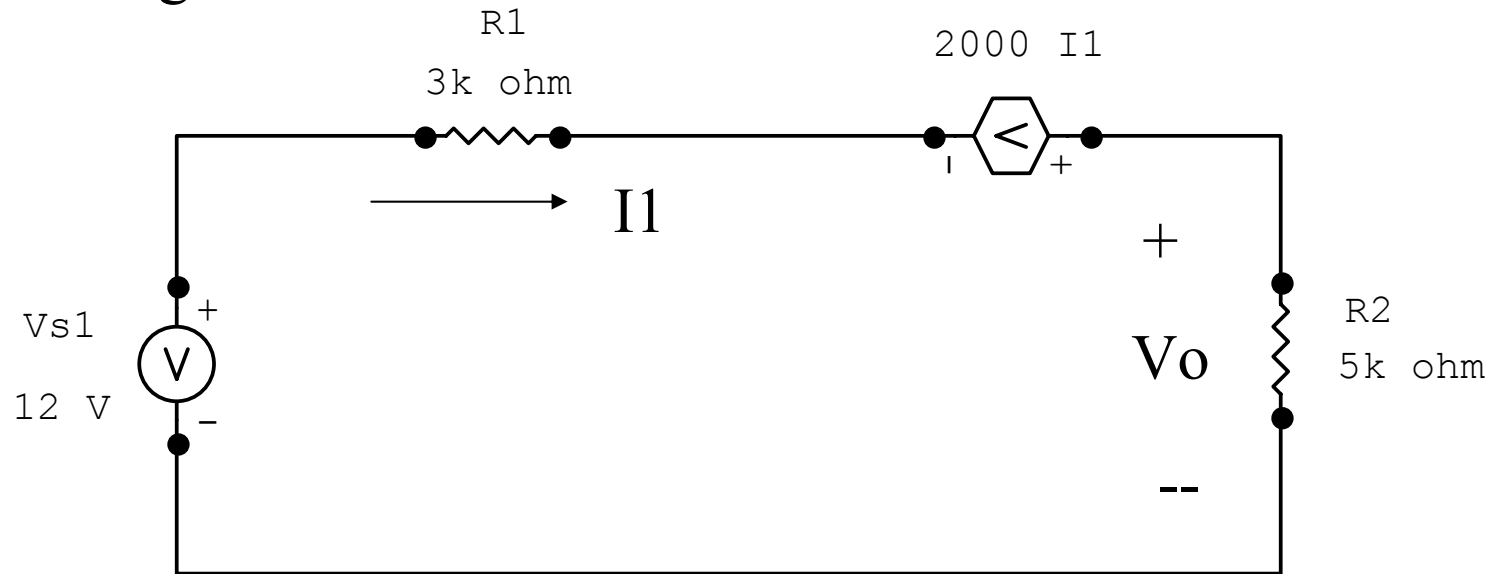
$$I_5 = \frac{V_a + V_b}{3\text{ k} + 1\text{ k}} = \frac{3 + 3}{4\text{ k}} = 1.5\text{ m A}$$

$$\therefore I_1 = I_2 + I_5 = 1.5\text{ m A} + 1.5\text{ m A} = 3\text{ m A}$$



Example :

Find V_0 ? Using KVL



$$-12 + 3k(I_1) - 2000I_1 + 5k(I_1) = 0$$

$$6kI_1 = 12 \quad \Rightarrow \quad I_1 = 2 \text{ mA}$$

$$V_0 = (5k\Omega)(I_1) = (5k)(2 \text{ mA})$$

$$V_0 = 10 \text{ V}$$