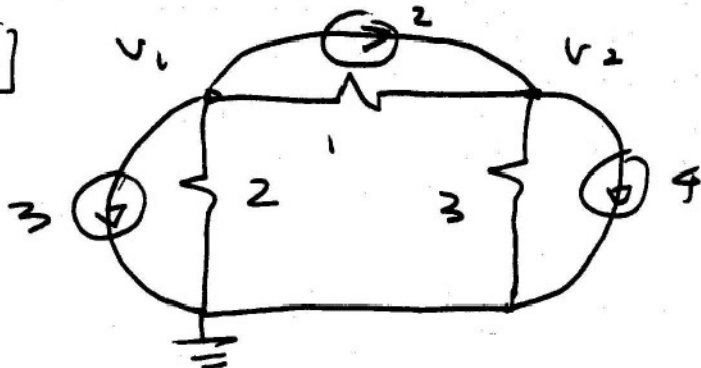


3.5-2



$$N1: \frac{v_1}{2} + \frac{v_1 - v_2}{1} = -3 - 2$$

$$N2: \frac{v_2}{3} + \frac{v_2 - v_1}{1} = 2 - 4$$

$$\left(\frac{1}{2} + 1\right)v_1 - v_2 = -5$$

$$-v_1 + \left(\frac{1}{3} + 1\right)v_2 = -2$$

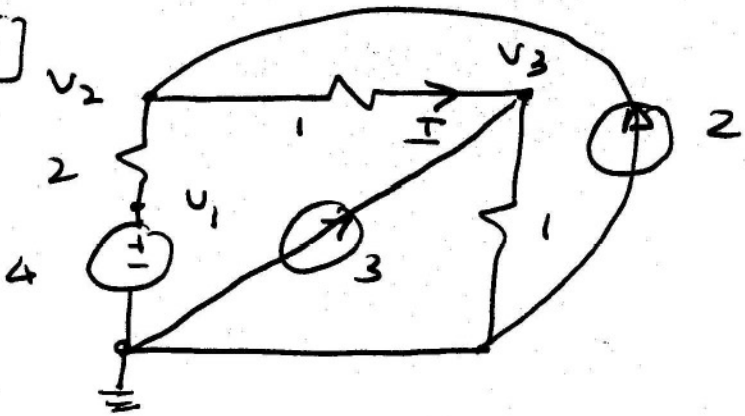
$$\begin{bmatrix} 3/2 & -1 \\ -1 & 4/3 \end{bmatrix} \begin{bmatrix} v_1 \\ v_2 \end{bmatrix} = \begin{bmatrix} -5 \\ -2 \end{bmatrix}$$

$$v_1 = -8.67 \text{ V}$$

$$v_2 = -8 \text{ V}$$

$$I = \frac{v_1 - v_2}{1} = \boxed{-0.667 \text{ A}}$$

3.5-7



$$N1: V_1 = 4$$

$$N2: \frac{V_2 - V_1}{2} + \frac{V_2 - V_3}{1} = 2$$

$$N3: \frac{V_3 - V_2}{1} + \frac{V_3}{1} = 3$$

$$N2: \left(\frac{1}{2} + 1\right) V_2 - V_3 = 2 + \frac{4}{2} = 4$$

$$N3: -V_2 + (1+1) V_3 = 3$$

$$\begin{bmatrix} 3/2 & -1 \\ -1 & 2 \end{bmatrix} \begin{bmatrix} V_2 \\ V_3 \end{bmatrix} = \begin{bmatrix} 4 \\ 3 \end{bmatrix}$$

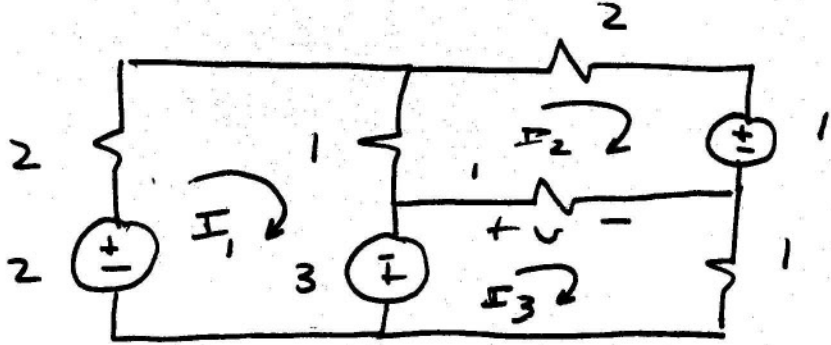
$$V_2 = 5.5 \text{ V}$$

$$V_3 = 4.25 \text{ V}$$

$$I = \frac{V_2 - V_3}{1} = \boxed{1.25 \text{ A}}$$

3.6-2

3/4



$$M1: 2I_1 + 1(I_1 - I_2) = 2 + 3$$

$$M2: 2I_2 + 1(I_2 - I_1) + 1(I_2 - I_3) = -1$$

$$M3: 1I_3 + 1(I_3 - I_2) = -3$$

$$\begin{bmatrix} 3 & -1 & 0 \\ -1 & 4 & -1 \\ 0 & -1 & 2 \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \\ I_3 \end{bmatrix} = \begin{bmatrix} 5 \\ -1 \\ -3 \end{bmatrix}$$

$$I_1 = 1.5789 \text{ A} \quad I_2 = -0.2632 \text{ A}$$

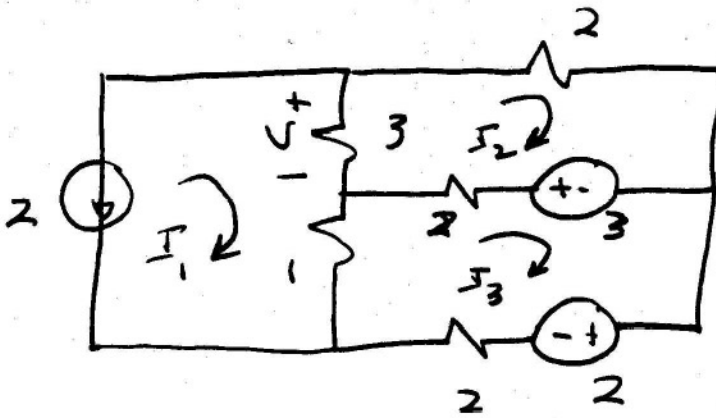
$$I_3 = -1.6316 \text{ A}$$

$$V = 1(I_3 - I_2)$$

$$= \boxed{-1.368 \text{ V}}$$

3.6-7

4/4



$$M1: I_1 = -2$$

$$M2: 2I_2 + 2(I_2 - I_3) + 3(I_2 - I_1) = 3$$

$$7I_2 - 2I_3 = 3 + 3I_1 = -3$$

$$M3: 2I_3 + 1(I_3 - I_1) + 2(I_3 - I_2) = -2 - 3$$

$$-2I_2 + 5I_3 = I_1 - 5 = -7$$

$$\begin{bmatrix} 7 & -2 \\ -2 & 5 \end{bmatrix} \begin{bmatrix} I_2 \\ I_3 \end{bmatrix} = \begin{bmatrix} -3 \\ -7 \end{bmatrix}$$

$$I_2 = -0.9355 \text{ V}$$

$$I_3 = -1.7742 \text{ V}$$

$$V = 3(I_1 - I_2)$$

$$= \boxed{-3.194 \text{ V}}$$