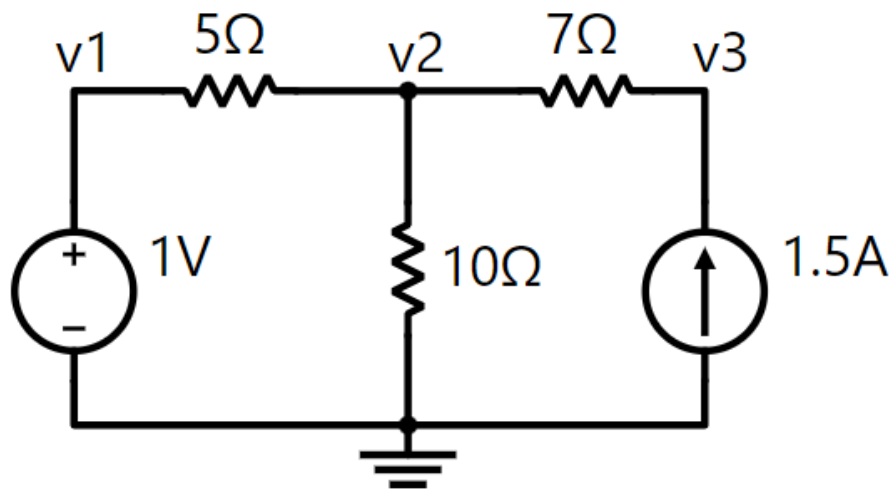


## HOMEWORK 2

ECE 580, 2022

1(a). Construct the modified node equations for the circuit Shown.

(b). Find the node voltages.



Solutions:

$$\begin{pmatrix} \frac{1}{5\Omega} & -\frac{1}{5\Omega} & 0 & 1 \\ -\frac{1}{5\Omega} & \frac{1}{5\Omega} + \frac{1}{10\Omega} + \frac{1}{7\Omega} & -\frac{1}{7\Omega} & 0 \\ 0 & -\frac{1}{7\Omega} & \frac{1}{7\Omega} & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix} \begin{pmatrix} v_1 \\ v_2 \\ v_3 \\ i_V \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 1.5A \\ 1V \end{pmatrix}$$

$$v_1 = 1V, v_2 = \frac{17}{3}V \approx 5.67V, v_3 = \frac{97}{6}V \approx 16.17V, i_V = \frac{14}{15}A \approx 0.93A$$