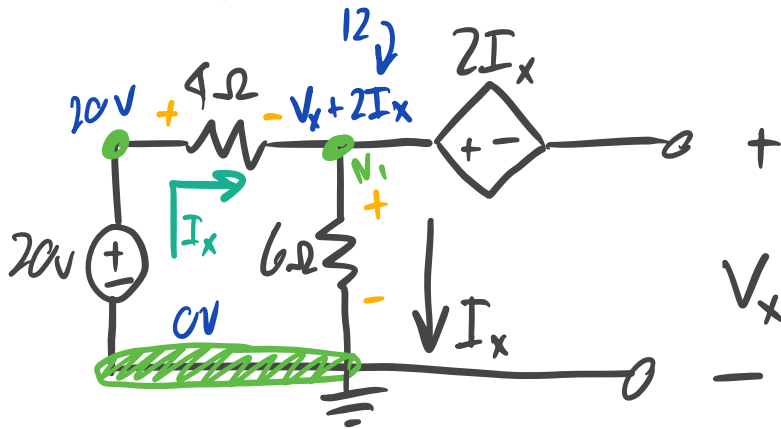


Problem One



3 Nodes - 1 Ref - 2 Voltage Sources = 0 unknowns

$$V_x + 2I_x = 6I_x$$

$$V_x + 2I_x = 20 - 4I_x$$

$$6I_x = 20 - 4I_x$$

$$10I_x = 20$$

$$I_x = 2A$$

$$V_x + 2(2) = 6(2)$$

$$V_x = 8V$$

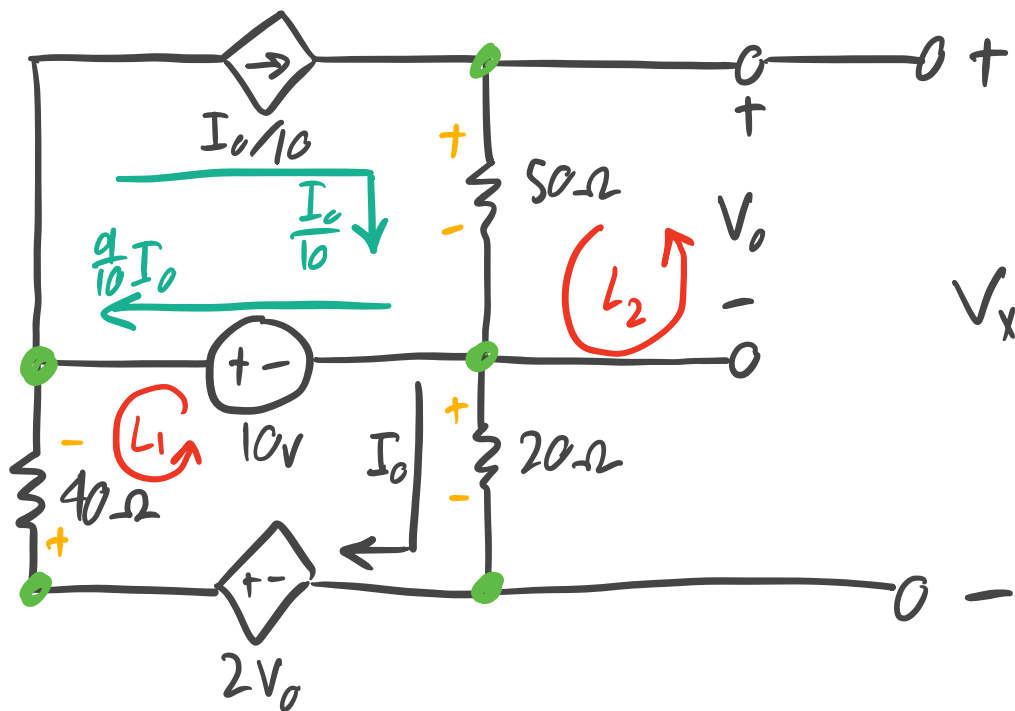
$$P_{20V} = -(20V)(2A) = -40W$$

$$P_{4\Omega} = (20 - 12 \text{ V})(2 \text{ A}) = 16 \text{ W}$$

$$P_{6\Omega} = (12 \text{ V})(2 \text{ A}) = 24 \text{ W}$$

$$P_{2I_x V} = (\sim \text{V})(0 \text{ A}) = 0 \text{ W}$$

Problem Two



2 Backyards - 1 Current Source = 1 unknown

Kvl on L_1

$$40I_o + 10 + 20I_o - 2V_o = 0$$

$$60I_o - 2V_o = -10$$

Kvl on L_2

$$-50 \frac{I_o}{10} + V_o = 0$$

$$-5I_o = -V_o$$

$$40I_o + 10 - 50 \frac{I_o}{10} + V_x - 2V_o = 0$$

$$V_o = 5I_o$$

$$60I_o - 2(5I_o) = -10$$

$$60I_o - 10I_o = -10$$

$$50I_o = -10$$

$$I_o = -\frac{1}{5}$$

$$V_x = 20I_o + 50 \frac{I_o}{10}$$

$$= 20I_o + 5I_o$$

$$= 25I_o$$

$$= -5V$$