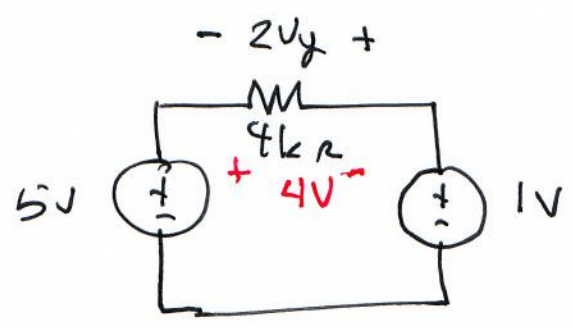
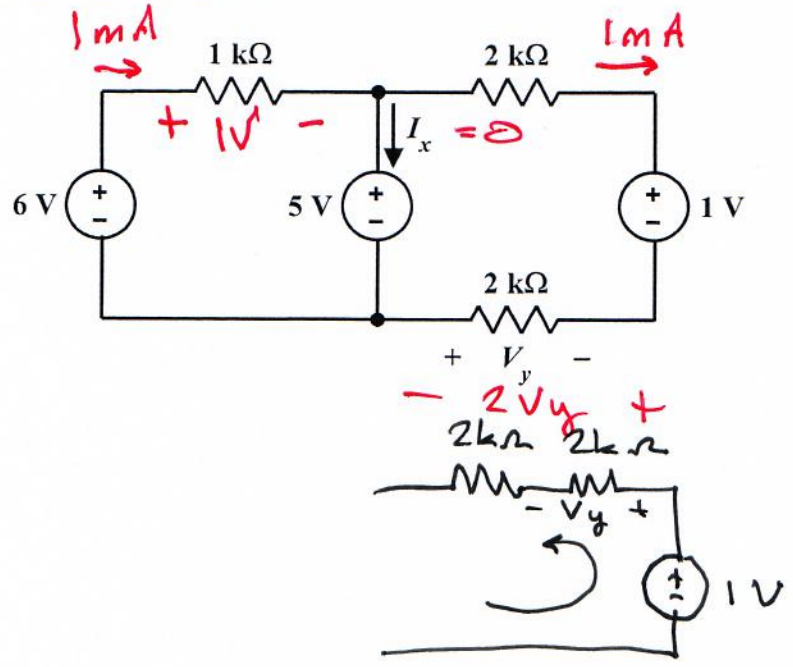
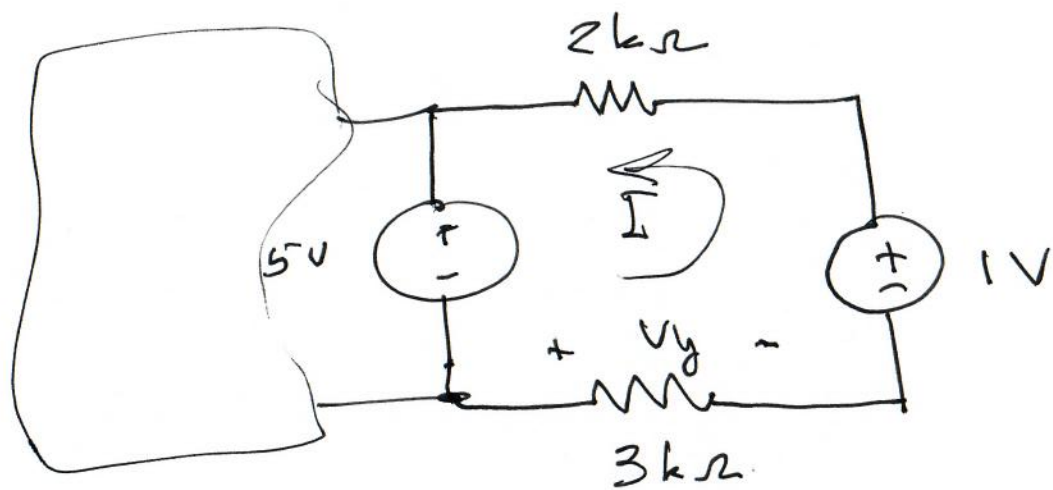


1. Determine the numerical values of I_x and V_y . **SHOW YOUR WORK**, and include units and proper signs with your answers.

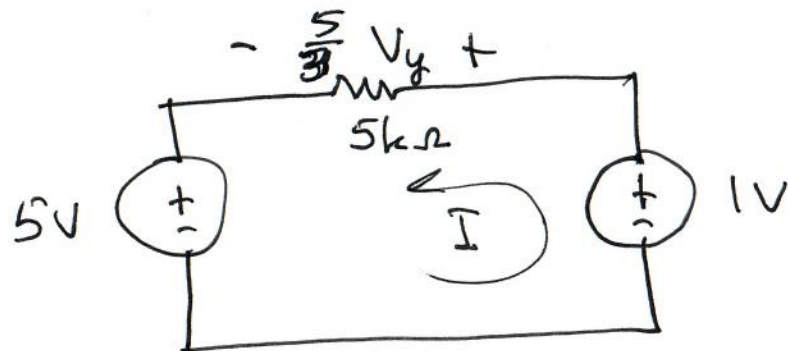


$$2V_y = -4V$$

$$V_y = -2V$$



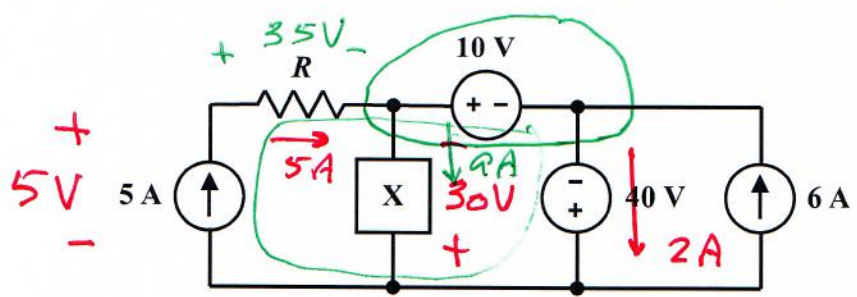
$$I = \frac{V_y}{3k\Omega}$$



$$\frac{5}{3}V_y = 1 - 5 = -4V$$

$$V_y = -\frac{3}{5}4V = -\frac{12}{5}V$$

2. The 5A current source is delivering 25W, and the 40V source is delivering 80W.



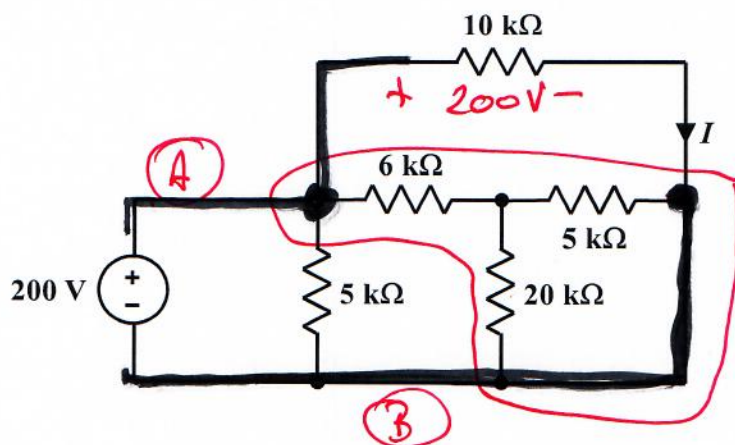
(a) Determine the value of resistor R . **SHOW YOUR WORK**, and include units with your answer.

$$R = \frac{35V}{5A} = 7\Omega$$

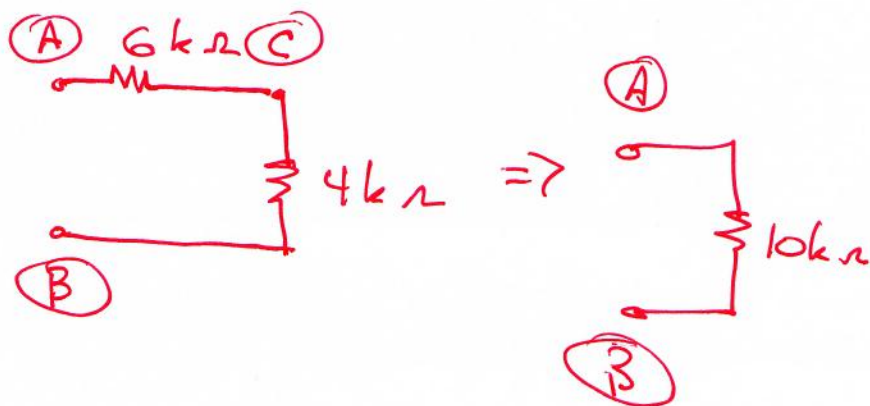
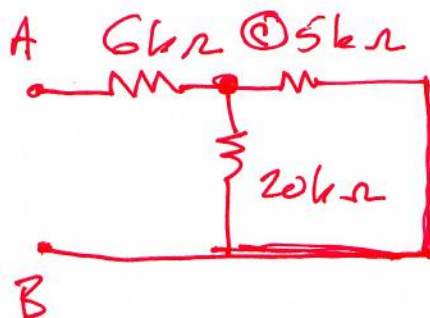
(b) Is component X absorbing power or delivering power? How much? **SHOW YOUR WORK**, and include units with your answer.

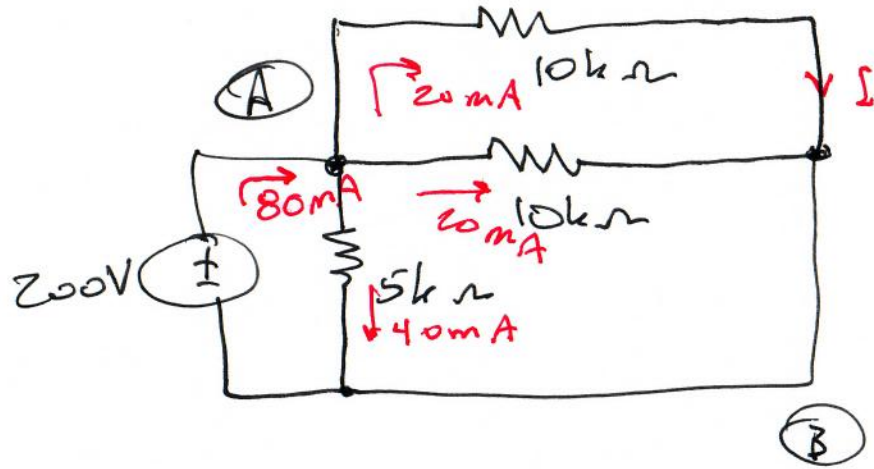
Delivering
 $(30V)(9A) = 270W$

3. Determine the numerical value of the current I . **SHOW YOUR WORK**, and include units and proper sign with your answer.

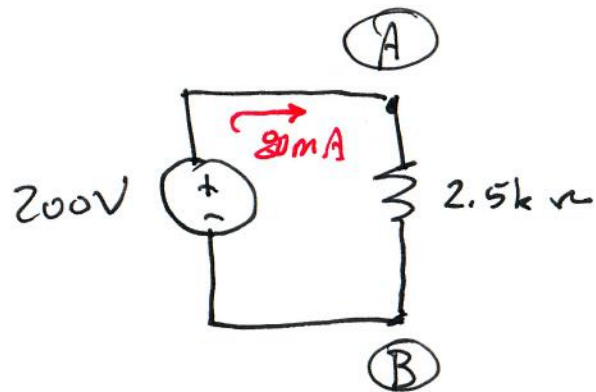
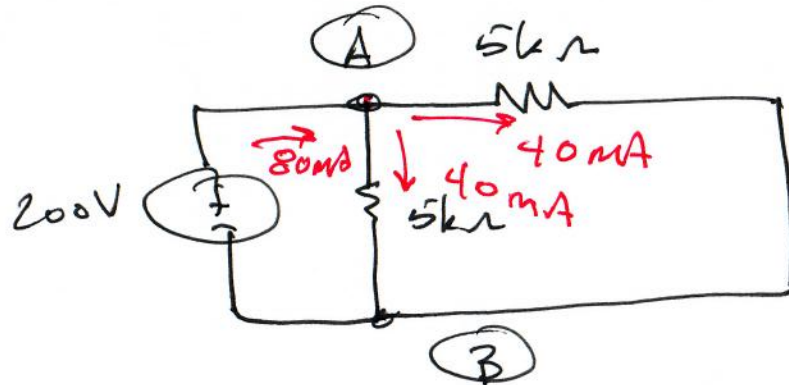


$$I = \frac{200V}{10k\Omega} = 20mA$$



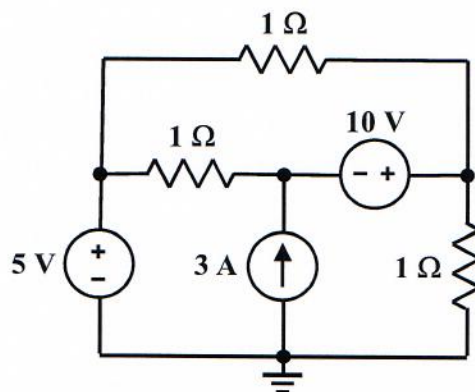


$$I = 20mA$$

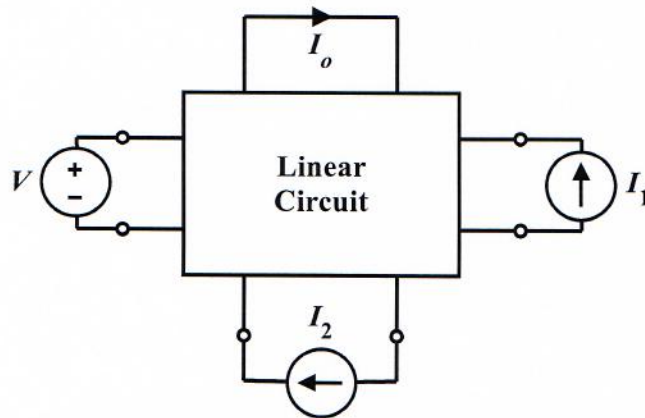


4. Use the nodal analysis method to formulate a system of simultaneous linear equations representing the circuit shown below. Express the equations in the matrix form discussed in class. SHOW YOUR WORK.

Do not attempt to solve the equations.



EE/EET 2240
Homework Problem #024



$I_o = 20 \text{ mA}$ when $V = 2 \text{ V}$, $I_1 = 0 \text{ A}$ and $I_2 = 2 \text{ A}$.

$I_o = 30 \text{ mA}$ when $V = 5 \text{ V}$, $I_1 = 2 \text{ A}$ and $I_2 = 1 \text{ A}$.

$I_o = 50 \text{ mA}$ when $V = 6 \text{ V}$, $I_1 = 3 \text{ A}$ and $I_2 = 5 \text{ A}$.

What will I_o be when $V = 4 \text{ V}$, $I_1 = 1 \text{ A}$ and $I_2 = 3 \text{ A}$?

$$I_o = K_1 V + K_2 I_1 + K_3 I_2$$

$$20 = 2K_1 + 0 + 2K_3$$

$$30 = 5K_1 + 2I_1 + 1K_3$$

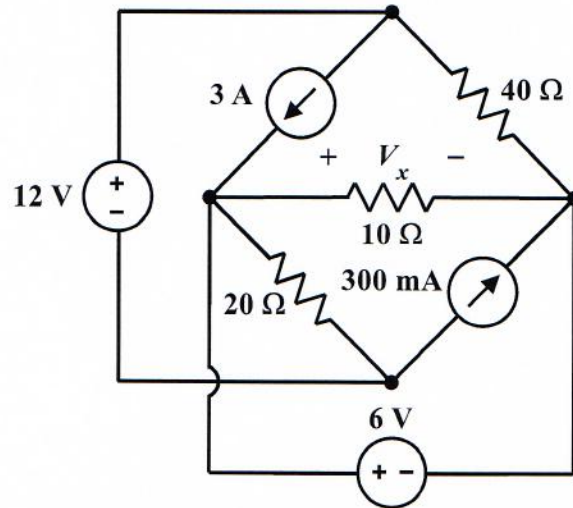
$$50 = 6K_1 + 3I_1 + 5K_3$$

$$\begin{bmatrix} 2 & 0 & 2 \\ 5 & 2 & 1 \\ 6 & 3 & 5 \end{bmatrix} \begin{bmatrix} K_1 \\ K_2 \\ K_3 \end{bmatrix} = \begin{bmatrix} 20 \\ 30 \\ 50 \end{bmatrix}$$

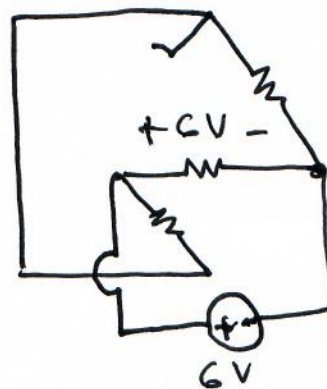
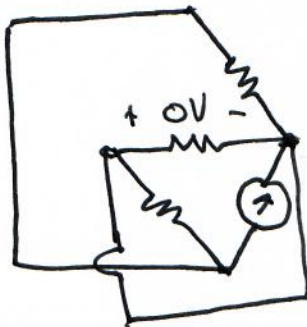
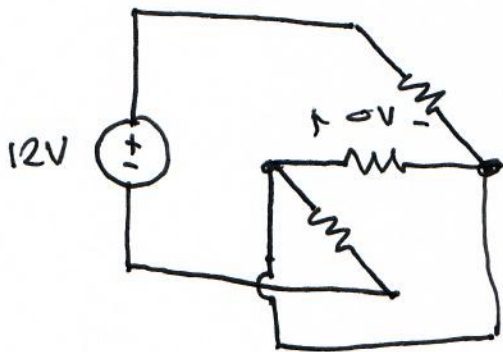
$$K_1 = 6 \quad K_2 = -2 \quad K_3 = 4$$

$$I_o = 6(4) - 2(1) + 4(3 \text{ A}) = 34 \text{ mA}$$

EE/EET 2240
Homework Problem #022



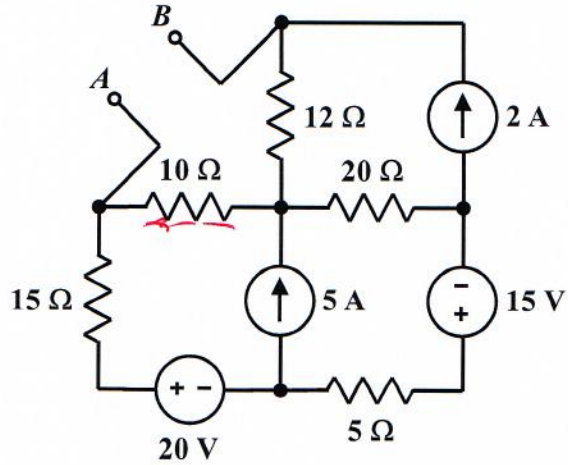
Use the superposition method to determine the value of V_x .



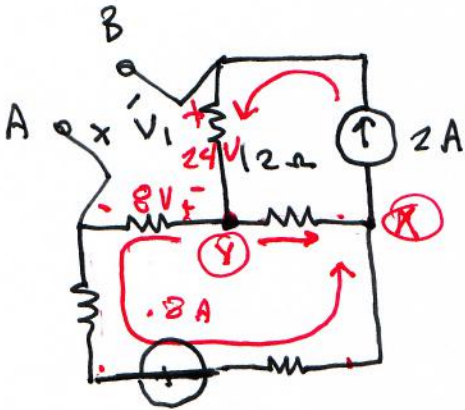
$$V_x = 0 + 0 + 0 + 6$$

$$= 6V$$

EE/EET 2240
Homework Problem #023

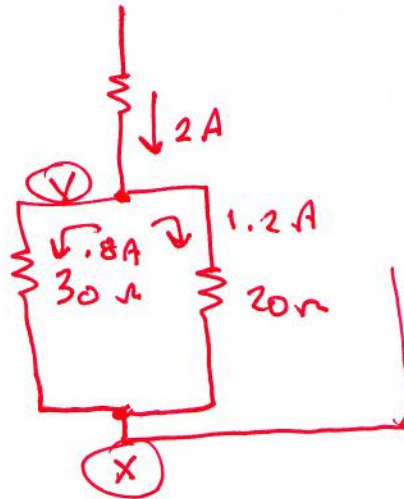


Use the superposition method to determine the value of V_{AB} .

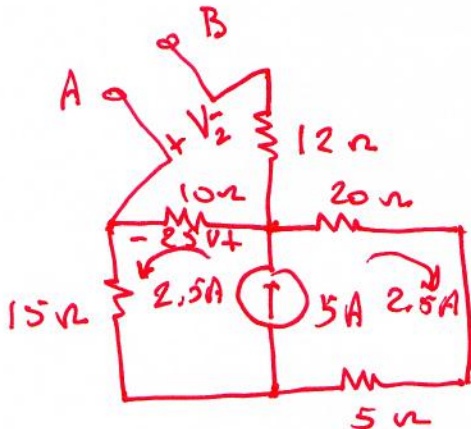


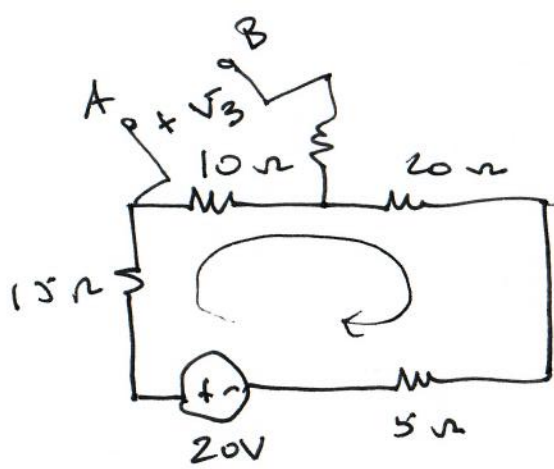
$$-V_1 = 32V$$

$$V_1 = -32V$$

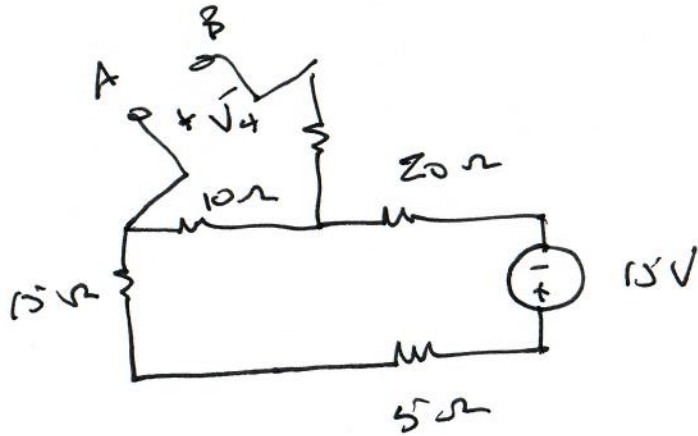
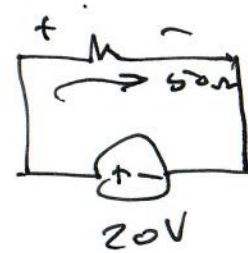


$$V_2 = -25V$$





$$V_3 = \frac{10}{50} \cdot 20V = 4V$$



$$V_4 = \frac{10}{50} \cdot 15V = 3V$$

$$V_{AB} = -32 - 25 + 4 + 3$$

$$= -50V$$