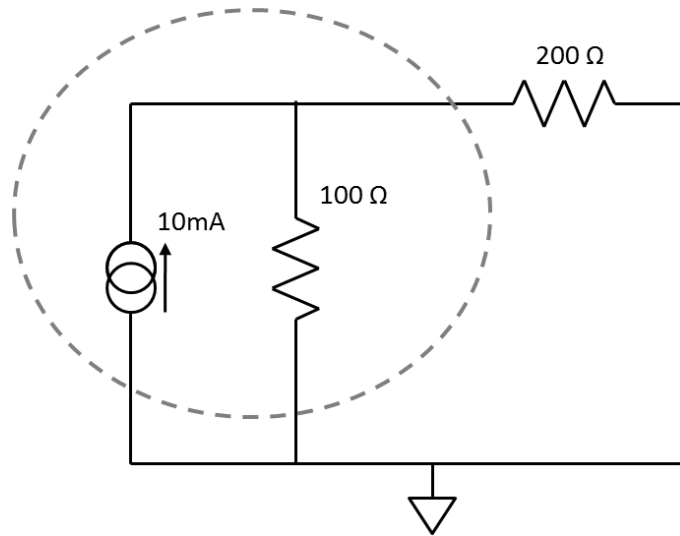


## Electronics Engineering Fundamentals

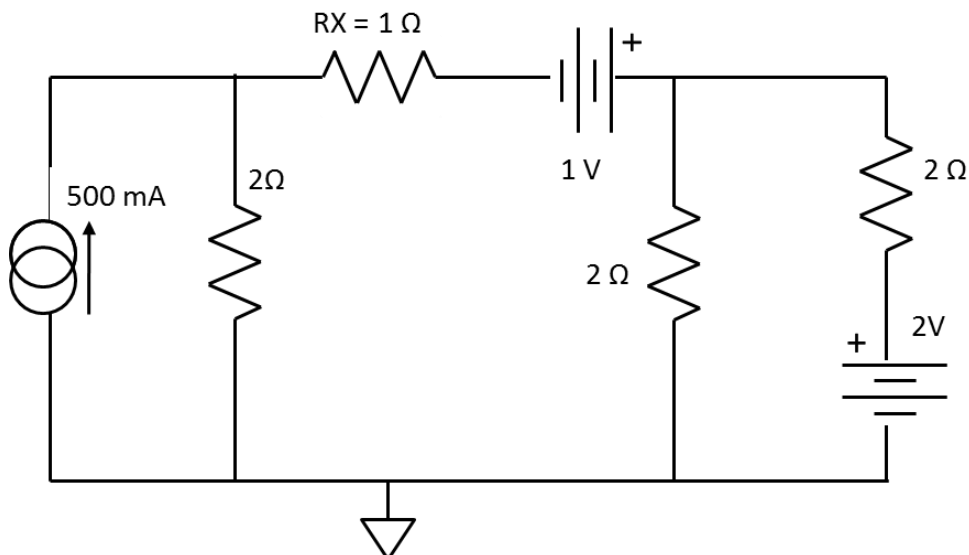
### Tutorial Sheet – 2

1. Using source transformations, convert the circled components into the equivalent voltage source and resistor. Sketch the resulting circuit with component values clearly marked. Calculate the current that flows through the  $200\ \Omega$  resistor.



*Answer: 3.33 mA*

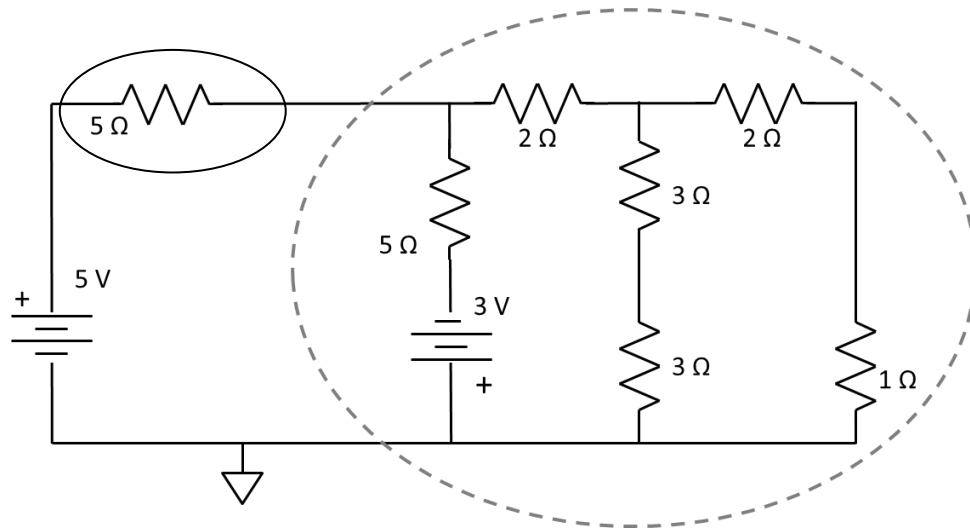
2. Using superposition theorem, determine the current flowing through and the voltage dropped across resistor  $R_X$ .



*Answer: 0.25 A from left to right, 0.25 V*

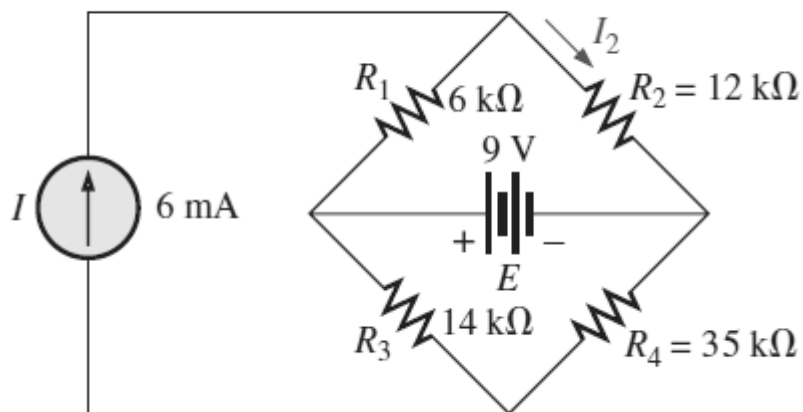
## Electronics Engineering Fundamentals Tutorial Sheet – 2

3. Using Thevenin's equivalent circuits, calculate the current that flows through the 5 Ohm resistor.



*Answer: 879 mA*

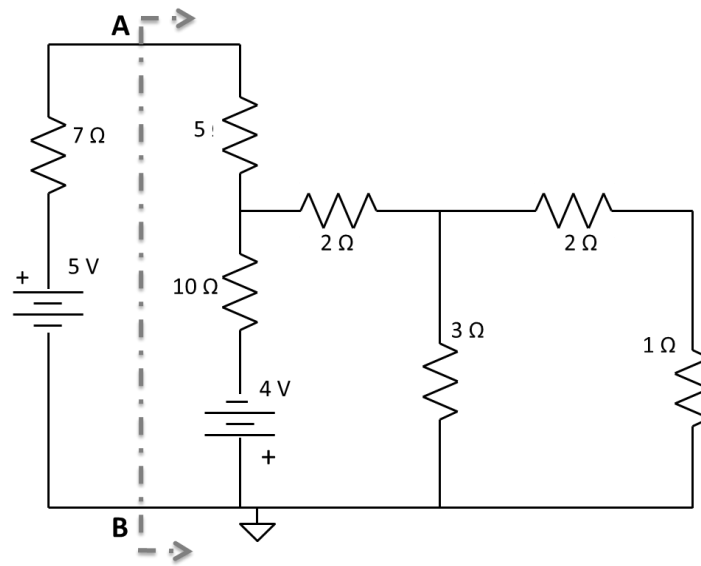
4. Using the principle of superposition, find the current  $I_2$  through the 12 kΩ resistor.



*Answer: 2.5 mA*

## Electronics Engineering Fundamentals Tutorial Sheet – 2

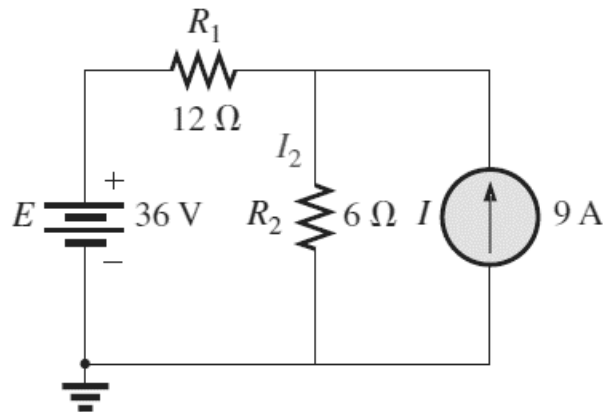
5. Using Thevenin equivalent circuits, calculate the current that flows through the 7 Ohm resistor.



*Answer: 0.413 A*

6. Superposition cannot be applied to power effects because the power is related to the square of the voltage across a resistor or the current through a resistor (for example, doubling the current through a resistor does not double the power to the resistor - as defined by a linear relationship).

Using the superposition theorem, determine the current through resistor  $R_2$ , and demonstrate that the superposition theorem is not applicable to power levels.



7. What is an open circuit? What is a short circuit?
8. What load should be applied to a system to ensure that the load is receiving maximum power from the system?