



MANIPAL INSTITUTE OF TECHNOLOGY

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# Basic Electrical Technology

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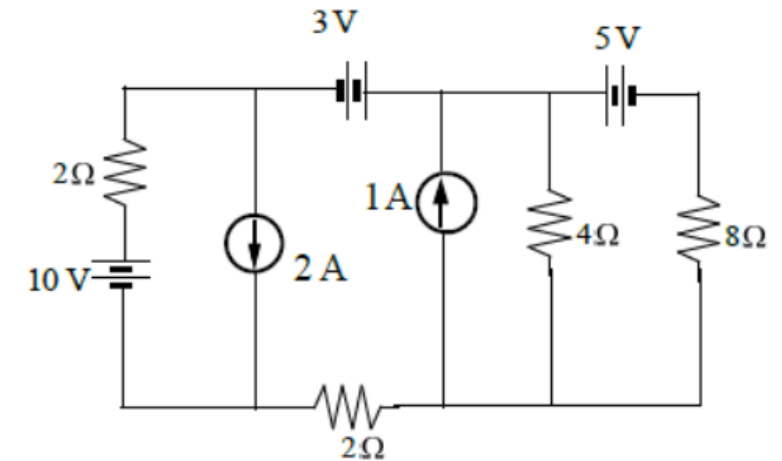
CLASS 7 – 13 NOVEMBER 2021

- TUTORIAL 1

# Source Transformation



Find the current through  $8\Omega$  resistor by source transformation method, in the circuit shown below

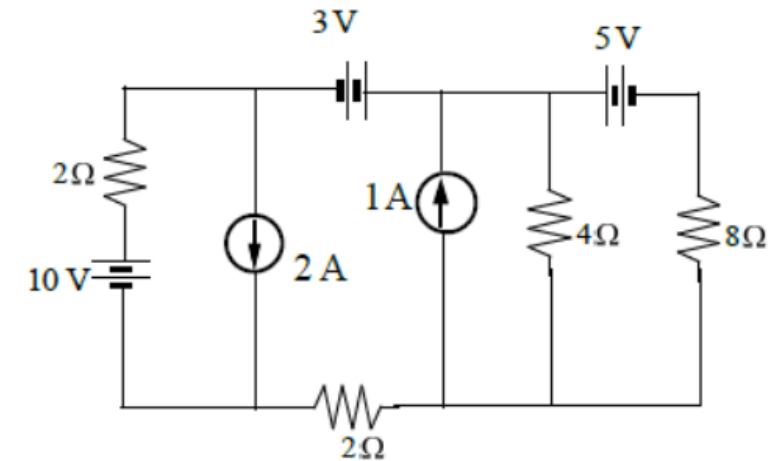


**Ans: 150 mA**

# Source Transformation



Find the current through  $8\Omega$  resistor by source transformation method, in the circuit shown below

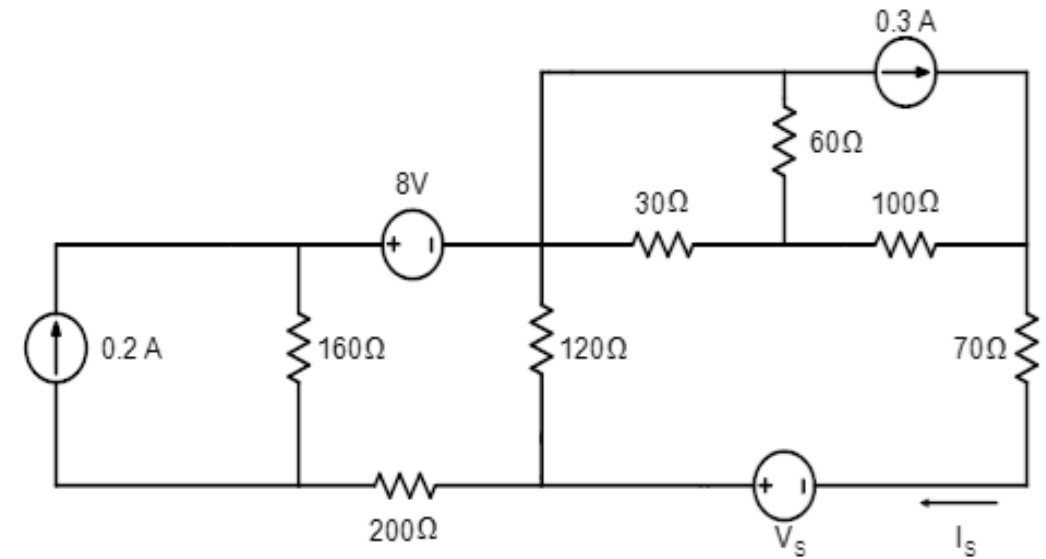


**Ans: 150 mA**

# Homework



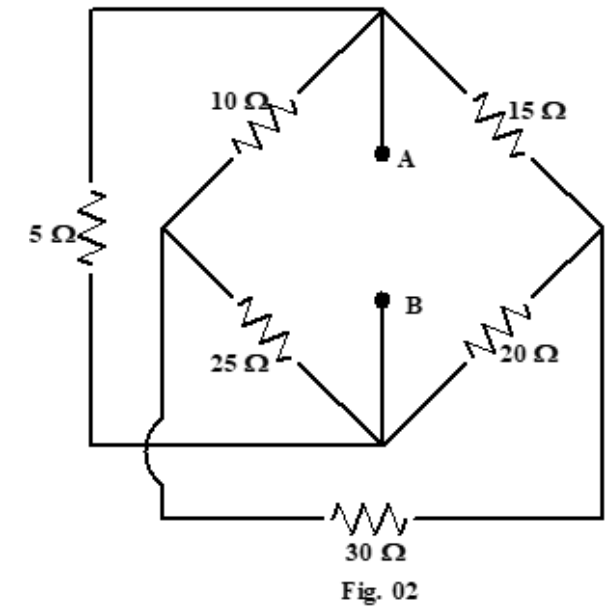
In the circuit shown, compute the value of  $V_s$  to deliver a current of  $I_s = 0.25$  A using source transformation.



**Ans:  $V_s = 28$  V**

# Star – Delta Transformation

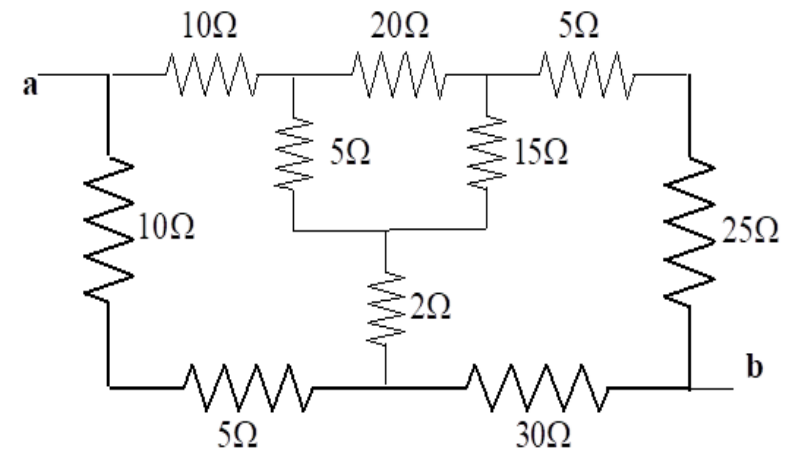
Determine the resistance between A and B in the network shown below



$$R_{AB} = 3.89 \Omega$$

# Homework

Determine the resistance between terminals a & b of the network shown in figure, using Star-Delta transformation.

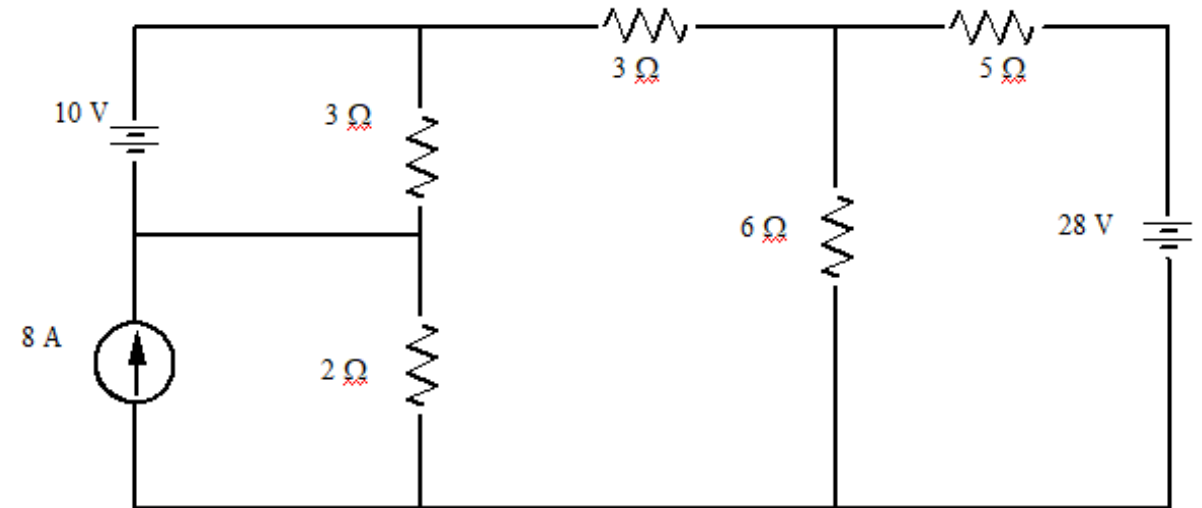


**Ans: 23.518 Ω**

# Mesh Current Analysis



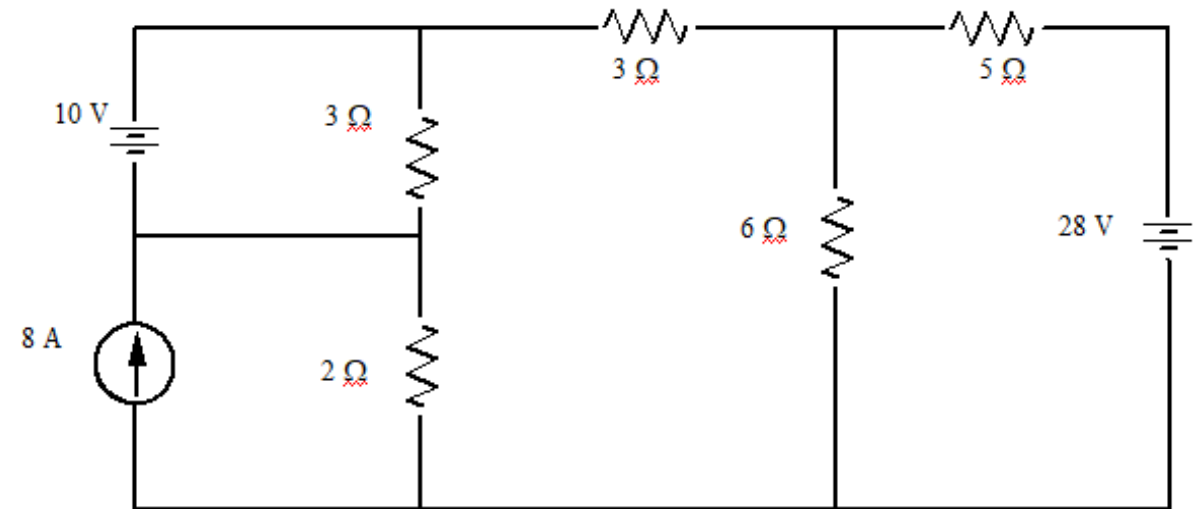
Find the voltage across the current source using mesh current analysis.



# Mesh Current Analysis



Find the voltage across the current source using mesh current analysis.

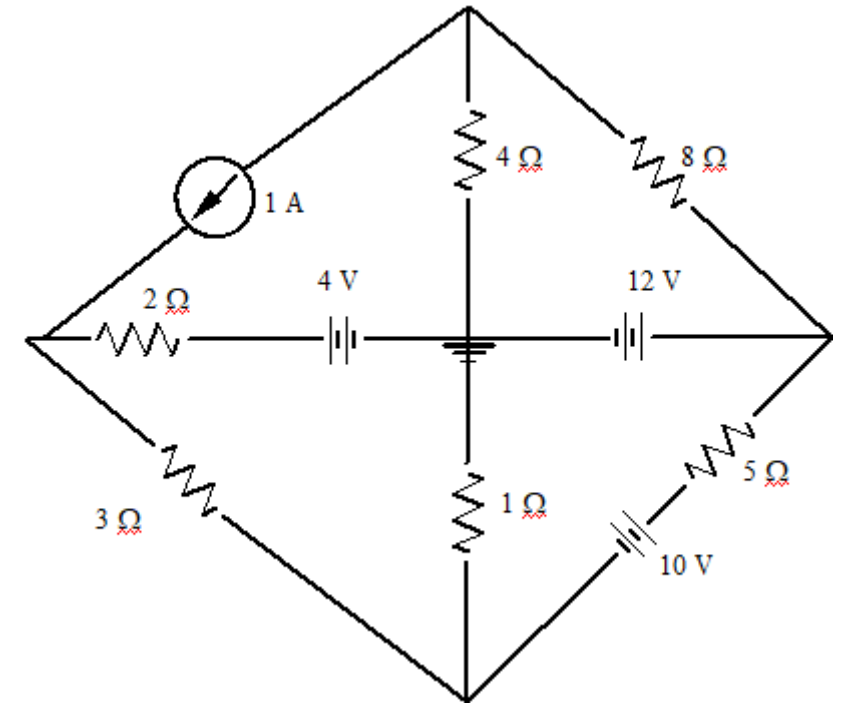




# Node Voltage Analysis



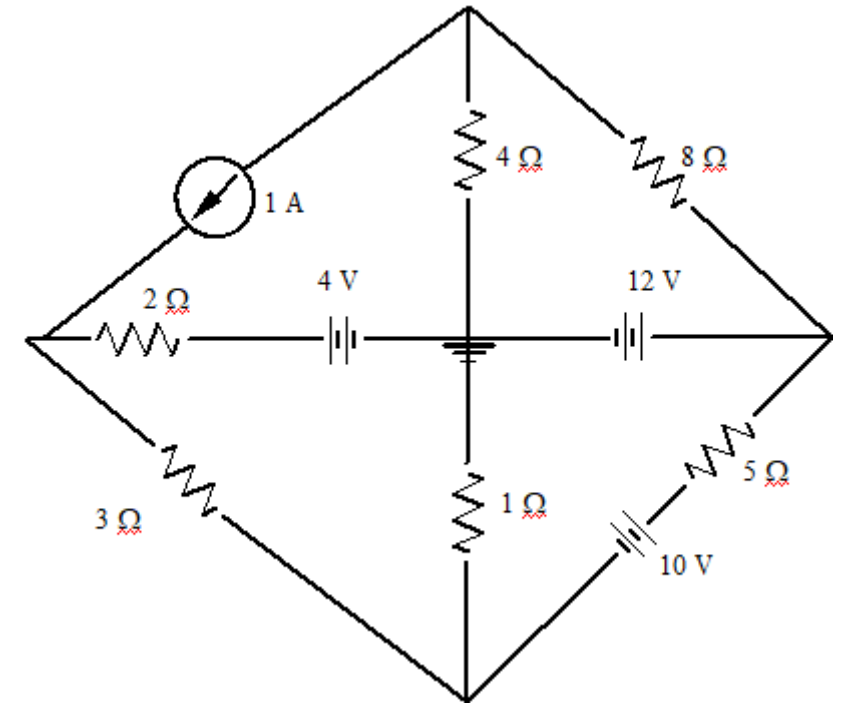
Find the voltage of all nodes using node voltage analysis



# Node Voltage Analysis



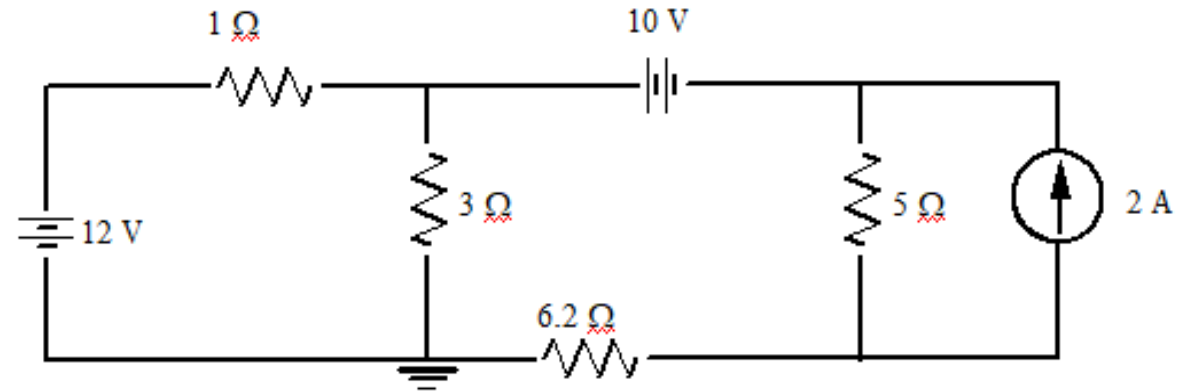
Find the voltage of all nodes using node voltage analysis



# Node Voltage Analysis



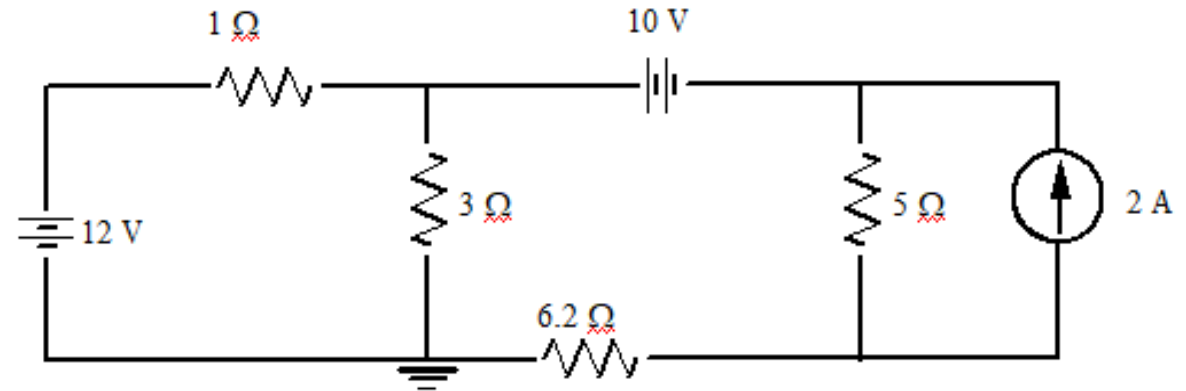
Find the node voltages and also current through  $1\ \Omega$ .



# Node Voltage Analysis



Find the node voltages and also current through 1 ohm.



# Illustration

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Two incandescent bulbs of 40 W and 60 W ratings are connected in series across the mains. Then which of the following statement(s) is(are) correct?

- a) The bulbs together will consume 100 W
- b) The bulbs together will consume 50 W
- c) The 60 W bulb glows brighter
- d) The 40 W bulb glows brighter

Assume the voltage rating of both the bulbs to be same