

LESSON 14 Intro to Ohm's Law

Watch video Lesson 14



George Ohm, a well-known scientist, discovered the law that governs Voltage, Current, and Resistance in an electric circuit.

We named the unit of resistance 'OHM' in his honor.

Ohm's Law is written in math like this:

$$E = I \times R$$

We say that Voltage (E) is equal to the current (I) times the resistance R.

E is voltage in **Volts**

I is current in **Amps**

R is resistance in **Ohms**



Mr. CIRCUIT



Practice Quiz

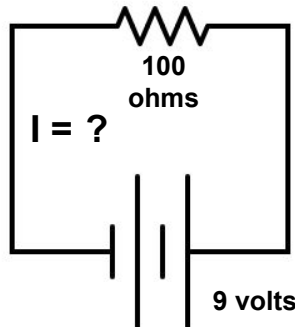
Let's use Ohm's Law

If you want to calculate the Voltage:
Voltage = I x R

If you want to calculate the Current:
Current = E / R

If you want to calculate the Resistance:
Resistance = E / I

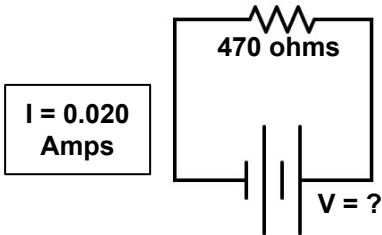
#1 Here is a schematic of a resistor and a battery. Calculate the **current** that is flowing in this circuit?



$$\begin{aligned} \text{Answer: Current} &= E / R \\ &= 9 / 100 \\ &= 0.09 \text{ Amps} \end{aligned}$$

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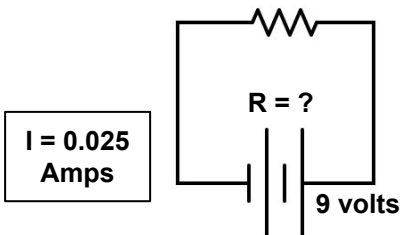
#2 Here is a schematic of a resistor and a battery. Calculate the **voltage** in this circuit?



$$I = 0.020 \text{ Amps}$$

$$\begin{aligned} \text{Answer: Voltage} &= I \times R \\ &= 0.020 \times 470 \\ &= 9.4 \text{ Volts} \end{aligned}$$

#3 Here is a schematic of a resistor and a battery. Calculate the **resistance** in this circuit?



$$I = 0.025 \text{ Amps}$$

$$\begin{aligned} \text{Answer: Resistance} &= E / I \\ &= 9 / 0.025 \\ &= 360 \text{ Ohms} \end{aligned}$$

Solve the following problems using Ohm's Law

Activity Page

Introduction to Ohm's Law

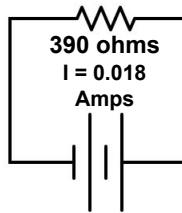
14b

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How much **voltage** are in these circuits?

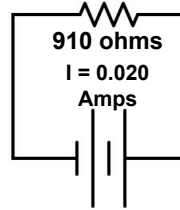
Ans: 7.02, 18.2, 23.8 volts

1



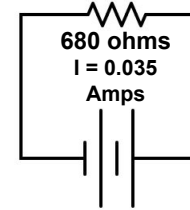
$E = \underline{\hspace{2cm}}$

2



$E = \underline{\hspace{2cm}}$

3

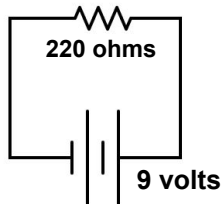


$E = \underline{\hspace{2cm}}$

How much **current** is flowing in these circuits?

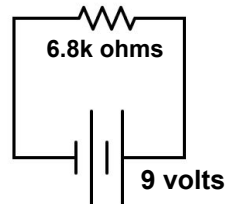
Ans: 0.04, 0.001, 0.009 Amps

4



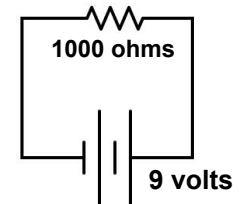
$I = \underline{\hspace{2cm}}$
Amps

5



$I = \underline{\hspace{2cm}}$
Amps

6

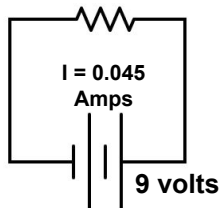


$I = \underline{\hspace{2cm}}$
Amps

How much **resistance** is in these circuits?

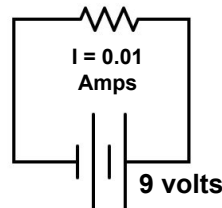
Ans: 200, 90, 45 ohms

7



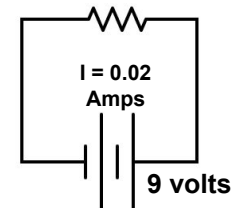
$R = \underline{\hspace{2cm}}$

8



$R = \underline{\hspace{2cm}}$

9



$R = \underline{\hspace{2cm}}$

