

Simple Circuit Analysis

Ohm's Law

Lesson 6
EET 150

Ohm's Law

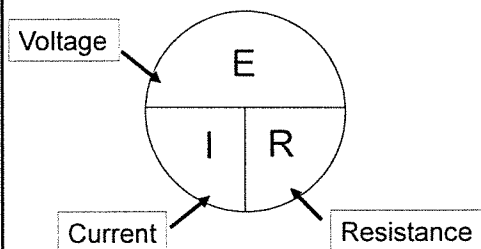
Learning Objectives

- In this lesson you will see:
- the mathematical relationship between voltage, current and resistance call Ohm's Law.
- the Ohm's Law circle and use it to find the three forms of the formula
- examples using Ohm's Law to find voltage, current and resistance
- the linear mathematical relationship between voltage and current
- the relationship between current and resistance is non-linear
- low resistance causes current to increase quickly

Ohm's Law

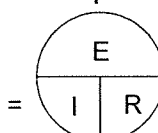
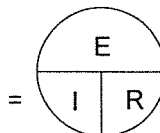
Ohm's Law – a mathematical formula that relates voltage, current and resistance

Three forms of Relationship
Ohm's Law Circle

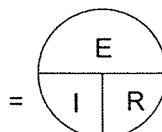


$$1.) E = IR$$

$$2.) R = \frac{E}{I}$$

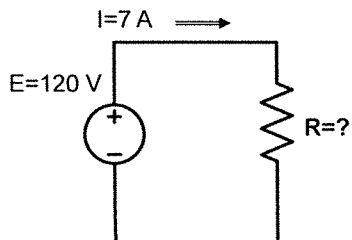


$$3.) I = \frac{E}{R}$$



Ohm's Law Example Calculations

- An electric heater draws 7 A from a 120 V dc source. What is the resistance of the heater coil?

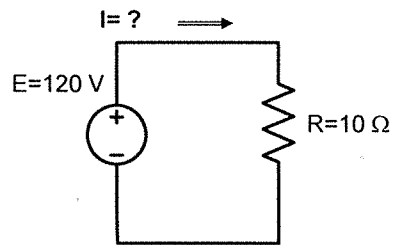


$$R = \frac{E}{I}$$

$$R = \frac{120 \text{ V}}{7 \text{ A}} = 17.14 \Omega \text{ (Ohms)}$$

Ohm's Law Example Calculations

- A water heater has a resistance of 10Ω . What current will it draw from a 120 V dc source?

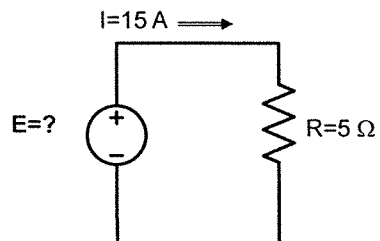


$$I = \frac{E}{R}$$

$$I = \frac{120 \text{ V}}{10 \Omega} = 12 \text{ A}$$

Ohm's Law Example Calculations

- An iron draws 15 A and has a 5 ohm heating element resistance. What is the supply voltage to the iron?



$$E = IR$$

$$E = (15 \text{ A})(5 \Omega) = 75 \text{ V}$$

End Lesson 6 EET 150

Coming Next: Basic Electric Circuits- Series
Connections

SIMPLE CIRCUIT ANALYSIS
OHM'S LAW



