

Ohm's Law problems

For each of the following problems:

- Identify the values for each variable
- Substitute the values for the variable into the formula
- Solve the equation including the appropriate units

Remember that current must be in amps not milliamps.

1. What is the voltage through an iron if 15 A flows and the resistance of the iron is 8.0 Ω ?

← Formula

Current =
Voltage =
Resistance =

← Substitution

← Answer with units

2. Determine the voltage lost on a stove element with resistance 24 Ω if it draws 7.5 A of current?

← Formula

Current =
Voltage =
Resistance =

← Substitution

← Answer with units

3. a. Calculate the voltage lost on a 15 Ω light bulb which draws 200 mA of current.

← Formula

Current =
Voltage =
Resistance =

← Substitution

← Answer with units

- b. A small light bulb is connected to a 3.0 V battery. If 200 mA of current is measured to be flowing through the bulb, calculate the resistance of the light bulb.

← Formula

Current =
Voltage =
Resistance =

← Substitution

← Answer with units

4. A computer technician measures 24 mA flowing through a 28Ω resistor in a computer. Calculate the voltage loss in the resistor.

← Formula

Current =
Voltage =
Resistance =

← Substitution

← Answer with units

5. Determine the current flowing through an 80Ω Christmas light bulb that is plugged into a 110 V circuit.

← Formula

Current =
Voltage =
Resistance =

← Substitution

← Answer with units

6. Calculate the current drawn by a 62Ω loud speaker when it is connected to a 120 V.

← Formula

Current =
Voltage =
Resistance =

← Substitution

← Answer with units

7. A 24Ω resistor is used to control the speed of a vacuum cleaner plugged into a 110 V circuit. If 90 V of energy are lost in the resistor, determine
- a. the voltage left to run the vacuum cleaner

← Formula

Current =
Voltage =
Resistance =

← Substitution

← Answer with units

- b. the current flowing through the resistor.

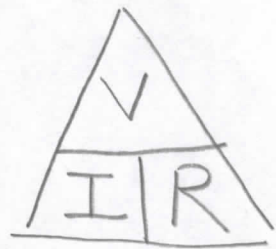
← Formula

Current =
Voltage =
Resistance =

← Substitution

← Answer with units

Ohm's Law problems



For each of the following problems:

- Identify the values for each variable
- Write the equation using words or symbols
- Substitute the values for the variable into the equations
- Solve the equation including the appropriate units

Remember that current must be in amps not milliamps.

1. What is the voltage through an iron if 15 A flows and the resistance of the iron is 8.0 Ω ?

Current = 15 A
 Voltage = 120 V
 Resistance = 8.0 Ω

$V = IR$ ← Equation

$V = 15 \text{ V} \cdot 8 \Omega$ ← Substitution

$V = 120 \text{ V}$

← Answer with units

2. Determine the voltage lost on a stove element with resistance 24 Ω if it draws 7.5 A of current?

Current =
 Voltage =
 Resistance =

$V = IR$ ← Equation

$V = (7.5)(24)$ ← Substitution

$V = 180 \text{ V}$

← Answer with units

3. a. Calculate the voltage lost on a 15 Ω light bulb which draws 200 mA of current.

Current =
 Voltage =
 Resistance =

$V = IR$
 $V = (.2)(15)$

$V = 3 \text{ V}$

$\frac{1000}{1000} = 0.2 \text{ A}$ ← Equation

← Substitution

← Answer with units

- b. A small light bulb is connected to a 3.0 V battery. If 200 mA of current is measured to be flowing through the bulb, calculate the resistance of the light bulb.

Current =
 Voltage =
 Resistance =

$R = \frac{V}{I}$ ← Equation

← Substitution

$R = \frac{3}{.2}$

← Answer with units

$R = 15 \Omega$



0.024 A

4. A computer technician measures 24 mA flowing through a 28 Ω resistor in a computer. Calculate the voltage loss in the resistor.

Current =
Voltage =
Resistance =

$$V = IR \quad \leftarrow \text{Equation}$$

$$V = 0.024(28) \quad \leftarrow \text{Substitution}$$

$$V = 0.672 \text{ V} \quad \leftarrow \text{Answer with units}$$

5. Determine the current flowing through an 80 Ω Christmas light bulb that is plugged into a 110 V circuit.

Current =
Voltage =
Resistance =

$$I = \frac{V}{R} \quad \leftarrow \text{Equation}$$

$$I = \frac{110}{80} \quad \leftarrow \text{Substitution}$$

$$I = 1.375 \text{ A} \quad \leftarrow \text{Answer with units}$$

6. Calculate the current drawn by a 62 Ω loud speaker when it is connected to a 120 V.

Current =
Voltage =
Resistance =

$$I = \frac{V}{R} \quad \leftarrow \text{Equation}$$

$$I = \frac{120 \text{ V}}{62 \Omega} \quad \leftarrow \text{Substitution}$$

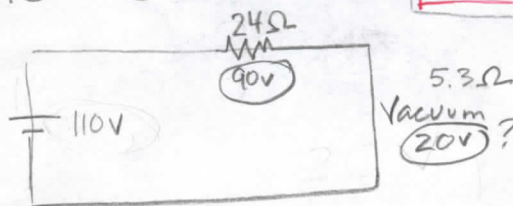
$$I = 1.94 \text{ A} \quad \leftarrow \text{Answer with units}$$

7. A 24 Ω resistor is used to control the speed of a vacuum cleaner plugged into a 110 V circuit. If 90 V of energy are lost in the resistor, determine

a. the voltage left to run the vacuum cleaner

$$110 = 90 + \boxed{20 \text{ V}}$$

Current =
Voltage =
Resistance =



$$\leftarrow \text{Equation}$$

$$\leftarrow \text{Substitution}$$

$$\leftarrow \text{Answer with units}$$

b. the current flowing through the resistor.

Current =
Voltage =
Resistance =

$$I = \frac{V}{R} \quad \leftarrow \text{Equation}$$

$$I = \frac{90 \text{ V}}{24 \Omega} \quad \leftarrow \text{Substitution}$$

$$I = 3.75 \text{ A} \quad \leftarrow \text{Answer with units}$$

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

$$R = \frac{20}{3.75}$$

$$R = 5.3 \Omega$$

$$V = IR$$

$$110 = 3.75(29.3)$$