

Goal • Review your understanding of how to use Ohm's law.

What to Do

Answer the following questions.

$$V = IR$$

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

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

1. What is the resistance of a toaster if a current of 12.5 A flows through it when it is connected to 120 V?

$$R = \frac{V}{I} = \frac{120\text{V}}{12.5\text{A}} = 9.6\ \Omega$$

2. A light bulb has a resistance of 90 Ω . What current flows through the bulb when it is connected to 120 V?

$$I = \frac{V}{R} = \frac{120}{90} = 1.3\text{ A}$$

3. A current of 0.50 A flows through a light bulb that has a resistance of 18 Ω . What is the voltage across this light bulb?

$$V = IR = 0.50 \times 18 = 9\text{ V}$$

4. A flashlight bulb has a resistance of 4.0 Ω . What current passes through the bulb if it is connected to 3.0 V?

$$I = \frac{V}{R} = \frac{3.0}{4.0} = 0.75\text{ A}$$

5. What potential difference is necessary to produce a current of 0.60 A in a load that has a resistance of 25 Ω ?

$$V = IR = 0.60 \times 25 = 15\text{ V}$$

6. The current through a load in a circuit is 2.5 A. If the potential difference across the load is 75 V, what is the resistance of the load?

$$R = \frac{V}{I} = \frac{75}{2.5} = 30\ \Omega$$

7. (a) An 80 V potential difference is measured across a light bulb that has a resistance of 16 Ω . What is the current through this light bulb?

$$I = \frac{V}{R} = \frac{80}{16} = 5\text{ A}$$

- (b) If the light bulb was replaced by a bulb with twice the resistance, what would be the new current through the bulb?

$$I = \frac{V}{R} = \frac{80}{(16 \times 2)} = 2.5\text{ A}$$

8. A 25 mA current flows through a 300 Ω lamp. What is the voltage across the lamp?

$$V = IR = 300 \times 0.025 = 7.5\text{ V}$$

$$25\text{ mA} = 0.025\text{ A}$$