

Name _____

Calculating Voltage

V	=	I	×	R
voltage (volts, V)	=	current (amperes, A)	×	Resistance (ohms, Ω)

Solve each problem.

1. What voltage produces a current of 50 A with a resistance of 20 ohms?

2. Silver has a resistance of 1.98×10^{-4} ohms. What voltage would produce a current of 100 A?

3. A current of 250 A is flowing through a copper wire with a resistance of 2.09×10^{-4} ohms. What is the voltage?

4. What voltage produces a current of 500 A with a resistance of 50 ohms?

5. What voltage would produce a current of 100 A through an aluminum wire that has a resistance of 3.44×10^{-4} ohms?

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Calculating Current

$$\text{Ohm's Law states that } I = \frac{V}{R}$$

where I = current (amperes, A)

V = voltage (volts, V)

R = resistance (ohms, Ω)

Solve each problem.

1. What is the current produced with a 9-volt battery through a resistance of 100 ohms?

2. Find the current when a 12-volt battery is connected through a resistance of 25 ohms.

3. If the potential difference is 120 V and the resistance is 50 ohms, what is the current?

4. What would be the current in problem 3 if the potential difference were doubled?

5. What would be the current in problem 3 if the resistance were doubled?

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Calculating Resistance

$$R = \frac{V}{I} \quad \text{resistance (ohms)} = \frac{\text{voltage (V)}}{\text{current (A)}}$$

Solve each problem.

1. What resistance would produce a current of 200 A with a potential difference of 2,000 V?
2. A 12-volt battery produces a current of 25 A. What is the resistance?
3. A 9-volt battery produces a current of 2.0 A. What is the resistance?
4. An overhead wire has a potential difference of 2,000 V. If the current flowing through the wire is one million amperes, what is the resistance of the wire?
5. What is the resistance of a lightbulb if a 120-volt potential difference produces a current of 0.8 A?

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Ohm's Law Problems

Using Ohm's Law, solve each problem.

1. What is the current produced by a potential difference of 240 V through a resistance of 0.2 ohms?

2. What resistance would produce a current of 120 A from a 6-volt battery?

3. What voltage is necessary to produce a current of 200 A through a resistance of 1×10^{-3} ohms?

4. What is the current produced by a 9-volt battery flowing through a resistance of 2×10^{-4} ohms?

5. What is the potential difference if a resistance of 25 ohms produces a current of 250 A?