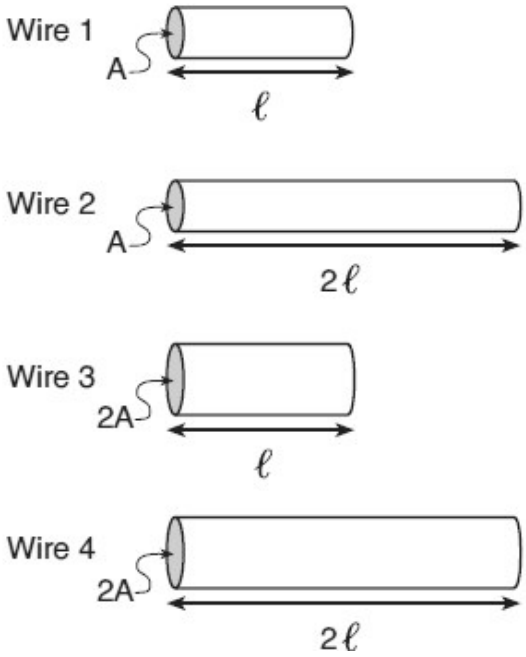
Name: _____

1. The diagrams below represent four pieces of copper wire at 20.°C. For each piece of wire, ℓ represents a unit of length and A represents a unit of cross-sectional area.



The piece of wire that has the greatest resistance is

A. wire 1
B. wire 2
C. wire 3
D. wire 4

2. Copper is a metal commonly used for electrical wiring in houses. Which metal conducts electricity better than copper at 20°C?

A. aluminum
B. gold
C. nichrome
D. silver

3. After an incandescent lamp is turned on, the temperature of its filament rapidly increases from room temperature to its operating temperature. As the temperature of the filament increases, what happens to the resistance of the filament and the current through the filament?

A. The resistance increases and the current decreases.
B. The resistance increases and the current increases.
C. The resistance decreases and the current decreases.
D. The resistance decreases and the current increases.

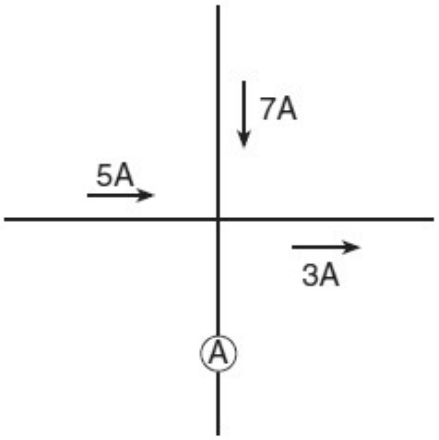
4. What is the resistance of a 20.0-meter-long tungsten rod with a cross-sectional area of 1.00×10^{-4} meter^2 at 20°C?

A. 2.80×10^{-5} Ω
B. 1.12×10^{-2} Ω
C. 89.3 Ω
D. 112 Ω

5.

A 25.0-meter length of platinum wire with a cross-sectional area of 3.50×10^{-6} meter^2 has a resistance of 0.757 ohm at 20°C. Calculate the resistivity of the wire. [Show all work, including the equation and substitution with units.]

6. The diagram below shows currents in a segment of an electric circuit.



What is the reading of ammeter *A*?

A. 1 A
B. 5 A
C. 9 A
D. 15 A

7. Which change decreases the resistance of a piece of copper wire?

A. increasing the wire's length
B. increasing the wire's resistivity
C. decreasing the wire's temperature
D. decreasing the wire's diameter

Figure 1

Base your answer to this question on the information below.

A 3.50-meter length of wire with a cross-sectional area of 3.14×10^{-6} meter^2 is at 20° Celsius. The current in the wire is 24.0 amperes when connected to a 1.50-volt source of potential difference.

8. **[Refer to figure 1]**

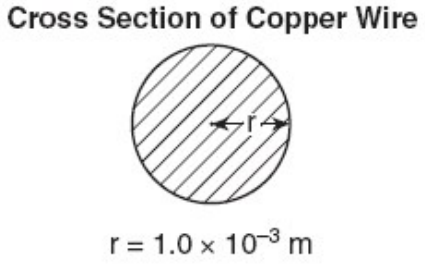
Calculate the resistivity of the wire.

A. $5.61 \times 10^{-8}\ \Omega \cdot m$
B. $6.51 \times 10^{-8}\ \Omega \cdot m$
C. $6.25 \times 10^{-2}\ \Omega$
D. $5.2 \times 10^{-6}\ \Omega \cdot m$

Figure 2

Base your answer to the question on the information and diagram below.

A 10.0-meter length of copper wire is at 20°C. The radius of the wire is 1.0×10^{-3} meter.



9. **[Refer to figure 2]**

Calculate the resistance of the wire.

A. $R = 7.5 \times 10^{-2}\ \Omega$
B. $R = 5.5 \times 10^{-2}\ \Omega$
C. $R = 3.5 \times 10^{-2}\ \Omega$
D. $R = 5.5 \times 10^{3}\ \Omega$