Ohm's Law

Review the Textbook on Current, Voltage, and Resistance measurements.

- **Phys 1402:** Serway/Vuille: Sections. 17.3, 17.4; Quick Quiz 17.4, 17.5
- **Phys 2426:** Serway/Jewett: Sections. 27.1, 27.2; Quick Quiz 27.2, 27.3

1. Name the devices for measurements of: (a) current, (b) potential difference, and (c) resistance.
(a. Ammeter; b. Voltmeter; c. Ohmmeter)

2. What is the value of the current flowing through the circuit shown in Figure 1?
(4 A)

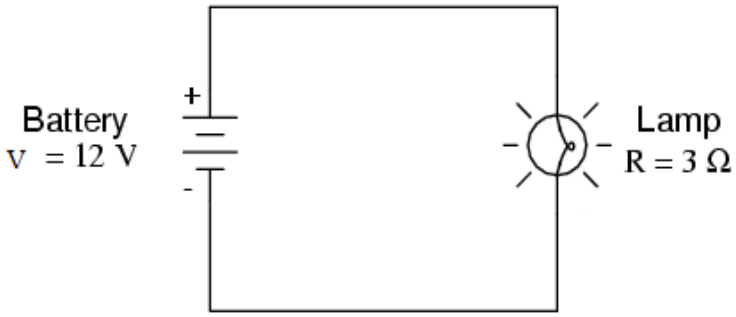

Figure 1: Simple electrical circuit

3. What is the direction of the current (clockwise or counterclockwise) in Picture 1?
(Clockwise)

4. If internal resistance of the battery shown in Picture 1 is 0.1Ω, what is emf of the battery?
(12.4V)

5. How much power dissipates in the circuit shown in Picture 1?
(49.6W)

6. What length of 3 mm diameter copper wire is needed to make 0.168Ω resistor, if the resistivity of copper is 1.72×10^{-8} Ω·m?
(69.0m)

7. Of the five wires listed in Table 1, which one has the smallest resistance?
(D, with a resistance of 0.0152 Ω.)

8. If the five wires listed in Table 1 are connected to identical batteries, which one carries the smallest current?
(A, with a resistance of 0.603 Ω.)

Wire	Material	Length	Diameter
A	Iron	2.0m	6.4e-4m
B	Copper	2.0m	6.4e-4m
C	Copper	2.0m	1.2e-3m
D	Copper	1.0m	1.2e-3m
E	Iron	2.0m	1.2e-3m

Table 1: Materials and dimensions of resistors; *resistivity of copper is 1.72e-8 Ωm; resistivity of iron is 9.7e-8 Ωm*