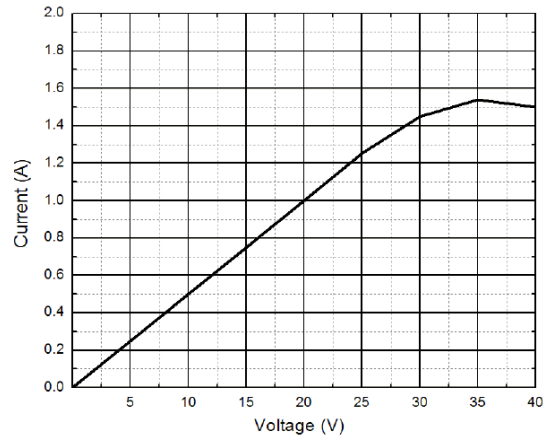


Ch. 20 Worksheet

1. A certain circuit contains a battery and a resistor. An instrument to measure the current in the circuit, an ammeter, is connected in between one of the terminals of the battery and one end of the resistor. The graph shows the current in the circuit as the voltage is increased. Which one of the following statements best describes the resistor in this circuit?

- The resistor does not obey Ohm's law.
- The resistor obeys Ohm's law for voltages between zero and twenty-five volts.
- The resistor obeys Ohm's law for voltages between zero and thirty-five volts.
- The resistor obeys Ohm's law for voltages between zero and forty volts.
- The resistor obeys Ohm's law for voltages between thirty and forty volts.



2. A potential difference of 3.00 nV is set up across a 2.00 cm length of copper wire that has a radius of 2.00 mm and resistivity of $1.69 \times 10^{-8} \Omega \cdot \text{m}$. How much charge drifts through a cross section in 3.00 ms?
3. An unknown resistor is connected between the terminals of a 3.00 V battery. Energy is dissipated in the resistor at the rate of 0.540 W. The same resistor is then connected between the terminals of a 1.50 V battery. At what rate is energy now dissipated?

4. A block in the shape of a rectangular solid has a width of 1.00 cm, a height of 3.50 cm, a front-to-rear length of 15.8 cm, and a resistance of 935Ω . A potential difference of 35.8 V is maintained between its front and rear faces.
- What is the current in the block?
 - What is the magnitude of the current density (J) assuming that $J = I/A$?