PHY 167 Recitation 3

1. A +3.5 μC charge is 23 cm to the right of a -7.2 μC charge. At the midpoint between the two charges, **(a.)** Determine the potential and **(b.)** the electric field (both magnitude and direction).

2. Determine the magnitudes and directions of the currents in each resistor in Figure 2 for each case: **(a.)** Ignoring internal resistance of the batteries and **(b.)** Assume each battery has an internal resistance of $r = 1.0\ \Omega$.

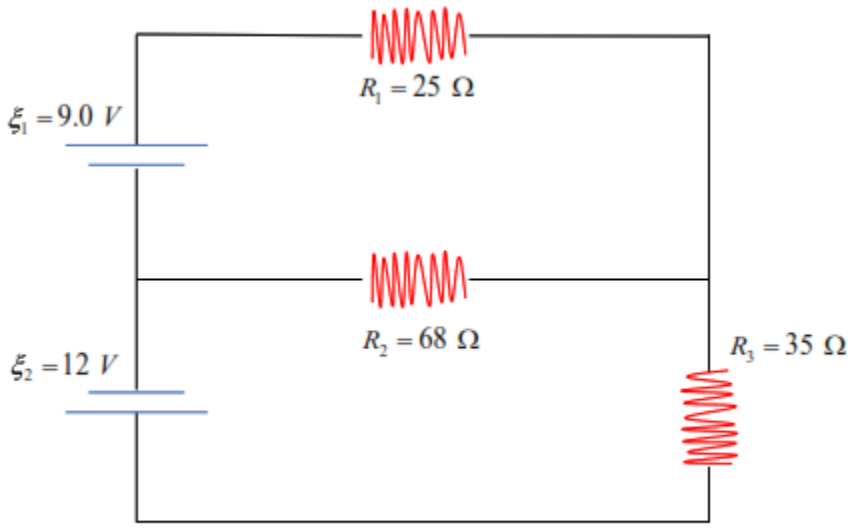

Figure 2.

3. Two long straight parallel wires are 15 cm apart. Wire A carries a 2.0-A current. Wire B's current is 4 A in the same direction. **(a.)** Determine the magnetic field magnitude due to wire A at the position of wire B. **(b.)** Determine the magnetic field due to wire B at the position of wire A. **(c.)** Are these two magnetic fields equal and opposite? Why or why not? **(d.)** Determine the force on wire A due to wire B, and the force on wire B due to wire A. Are these two forces equal and opposite? Why or why not?

4. A 600-turn solenoid, 25 cm long, has a diameter of 2.5 cm. A 14-turn coil is wound tightly around the center of the solenoid. If the current in the solenoid increases uniformly from 0 to 5.0 A in 0.6s, what will be the induced emf in the short coil during this time?