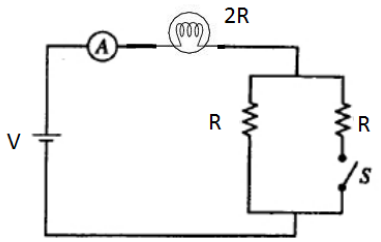
AP Physics C: Electricity & Magnetism Name: _____

Unit 4 Quiz

1. A battery supplies voltage V and is connected to a circuit with a lightbulb and resistors with resistance shown on the diagram.
   a) The ammeter reads a current of I when the switch is open. What does the ammeter read when the switch is closed?



   b) What happens to the brightness in the bulb when the switch is closed? Justify your answer.

2. For the circuit shown the right:

a) Find the equivalent resistance.

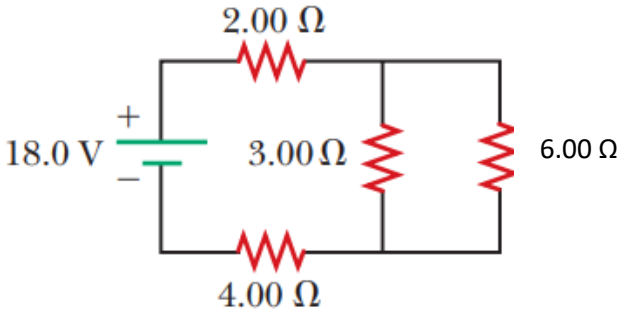
b) Find the current through each of the follow:

   i. the battery

   ii. The 3 Ω resistor

   iii. The 6 Ω resistor

c) Which resistor dissipates the most power?



3. A 3 m long power cord is in the shape of a cylindrical wire and has a resistance of 60 Ω. It has a diameter of 10 mm.
   a) What is the resistivity of the material the cord is composed of?

   b) Over time the power cord heats up. What should happen to the current flowing through it over time?

4. Suppose the in the classroom lights, there is a crosssectional area of .0001m^2 and an electron density of 3.00×10^{25} m^{-3}. If the wire between the light switch and the light bulb is 6.5 meters, how long does it take an electron to travel from the switch to the bulb? There is current in the wire I guess. Idk. It's 2 A.