**Worksheet 6.1 Electric Circuits**
Complete on a separate sheet of paper.

1) A current of 3.60 A flows for 15.3 s through a conductor. Calculate the number of electrons that pass through a point in the conductor in this time. (3.44×10^{20})

2) How long would it take 2.0×10^{20} electrons to pass through a point in a conductor if the current was 10.0 A?

(3.2 s)

3) Calculate the current if a charge of 5.60 C passes through a point in a conductor in 15.4 s.   (0.364 A)

4) What is the potential difference across a conductor to produce a current of 8.00 A if there is a resistance in the conductor of 12.0 Ω?   (96 V)

5) What is the heat produced in a conductor in 25.0 s if there is a current of 11.0 A and a resistance of 7.20 Ω?

(21 800 J)

6) 150 J of heat are produced in a conductor in 5.50 s. If the current through the conductor is 10.0 A, what is the resistance of the conductor?   (0.273 Ω)

7) What is the current through a 400 W electric appliance when it is connected to a 120 V power line?

(3.33 A)

8) a. When an electric appliance is connected to a 120 V power line, there is a current through the appliance of 18.3 A. What is its resistance?   (6.56 Ω)

b. What is the average amount of energy given to each electron by the power line? $(1.92 \times 10^{-17}$ J)

9) a. What potential difference is required across an electrical appliance to produce a current of 20.0 A when there is a resistance of 6.00 Ω?   (120 V)

b. How many electrons pass through the appliance every minute? (7.5×10^{21})

10) A student designed an experiment in order to measure the current through a resistor at different voltages. Given the following data:

a. Draw a graph showing the relationship between current and voltage (V vs. I)

Voltage (V)	Current (I)
3.0	0.151
6.0	0.310
9.0	0.448
12.0	0.511
15.0	0.750
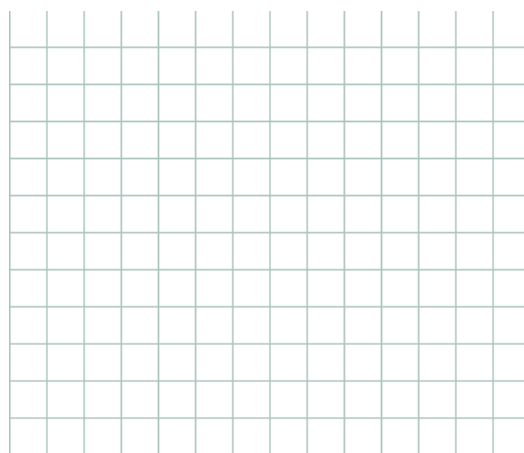
b) Using the graph, what is the resistance of the resistor?   (20.0 +/- 0.5 Ω)