

Name: _____

Physics 11

Problem Set 3.9

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 12.0Ω ?

(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 7.20Ω ?

(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) 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)

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 6.00Ω ?

(120 V)

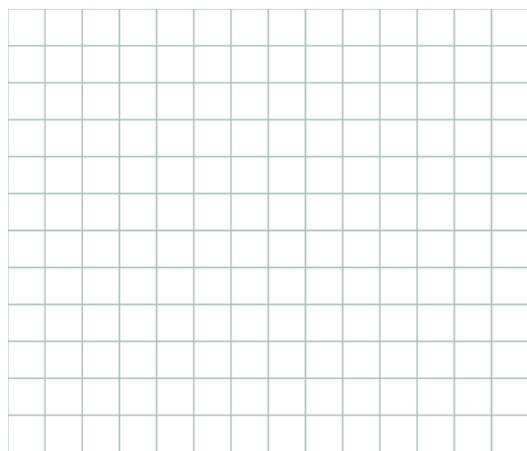
b. How many electrons pass through the appliance every minute?

(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:

Voltage (V)	Current (I)
3.0	0.151
6.0	0.310
9.0	0.448
12.0	0.511
15.0	0.750

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



b) Using the graph, what is the resistance of the resistor?

(20.0 +/- 0.5 Ω)