

## Ohm's Law Practice

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### Concepts

- A. What is Ohm's Law?
  
- B. If you double the voltage across a resistor, what will happen to the current flowing through the resistor? What if you triple the voltage?
  
- C. If you double the resistance of something, but keep the voltage the same, what will happen to the current? What if you triple the resistance?
  
- D. Do conductors have low resistance or high resistance? Why?
  
- E. Fill out the chart below:

	<i>Variable</i>	<i>Units</i>	<i>Equation</i>	<i>Explanation</i>
Charge				
Voltage				
Current				
Resistance				

### Problems - Just Ohm's Law

1. How much current would pass through a  $3\ \Omega$  resistor when there was 6 volts applied to the resistor?
  
2. What voltage is needed to make 1.5 A of current flow through a toaster with a resistance of  $75\ \Omega$ ?
  
3. What is the resistance of the heating element in a car lock de-icer that contains a 1.5 V battery supplying a current of 0.5 A to the circuit?
  
4. What voltage is needed to get a current of 0.25 A to flow through a  $75\ \Omega$  resistor?
  
5. Justine's hair dryer has a resistance of  $90\ \Omega$  when first turned on. How much current does the hair dryer draw from the 110 V line in Justine's house?
  
6. Dinah's oven uses a 220 V line and draws 8 A of current when heated to its maximum temperature. What is the resistance of the oven when it is fully heated?

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$V=IR$

$I=Q/t$

$Q=ne$

$V=PE/Q$

$e = 1.6 \times 10^{-19} \text{ C}$

7. 50 C of charge flows through a light bulb in 2 minutes when it is plugged into a 120 V outlet. What is the resistance of the light bulb?
  
8. An  $80 \Omega$  toaster is plugged into a 120 V outlet. How much charge passes through the toaster in the 3 minutes it takes to make your toast?
  
9. 4 Coulombs of charge lose 8 Joules of energy in 10 seconds when going through a resistor. What is the resistance of the resistor?
  
10. If  $5 \times 10^{20}$  electrons pass through a resistor in 30 seconds when there is 4 volts applied to the resistor, what is the resistance of the resistor?
  
11. Imagine a radio uses 100 J of energy when 11 C of charge pass through it and that it takes 30 seconds for this to happen. What is the resistance of the radio?
  
12. A  $25 \Omega$  appliance needs 5000 J of energy to push 1500 C of charge through it. How long would it take for that to happen?

Answers: 1) 2 A    2) 113 V    3) 3  $\Omega$     4) 18.8 V    5) 1.22 A    6) 27.5  $\Omega$     7) 288  $\Omega$   
 8) 270 C    9) 5  $\Omega$     10) 1.5  $\Omega$     11) 24.8  $\Omega$     12) 3.13 hours