Ohms Law Practice Answers

1. How much current is in a circuit that includes a 9- volt battery and a bulb with resistance of 3 ohms ?

   V = 9V   I = V/R
   R = 3 Ω   I = 9V / 3 Ω
   I = ?   I = 3 A

2. A circuit contains a 1.5V battery and a bulb with a resistance of 3 ohms. Calculate the current.

   V = 1.5 V   I = V/R
   R = 3 Ω   I = 1.5V / 3 Ω
   I = ?   I = 0.5 A

3. A circuit contains two 1.5V batteries and a bulb with a resistance of 3 ohms. Calculate the current.

   V = 3V (1.5 x 2)   I = V/R
   R = 3 Ω   I = 3V / 3 Ω
   I = ?   I = 1A

4. What is the voltage of a circuit with 15 amps of current and a toaster with 8 ohms of resistance.
   V = ?   V = I x R
   I = 15 A   V = 15 A x 8 Ω
   R = 8 Ω   V = 120 volts

5. A light bulb has a resistance of 4 ohms and a current of 2A. What is the voltage across the bulb?

   R = 4 Ω   V = I x R
   I = 2A   V = 2A x 4 Ω
   V = ?   V = 8 volts

6. How many ohms of resistance must be present in a circuit that has 120 volts and a current of 10 amps?

   R = ?   R = V / I
   V= 120 V   R = 120 v / 10A
   I = 10 A   R = 12 Ω

7. A portable CD player uses two 1.5 V batteries. If the current in the CD player is 2 A, what is its resistance?

   V = 3V (1.5 x 2)   R = V / I
   I = 2A   R = 3V / 2A
   R = ?   R = 1.5 Ω

8. You have a large flashlight that takes 4 D cell batteries. If the current in the flashlight is 2 amps, what is the resistance of the light bulb? (HINT: a D-cell battery has 1.5 volts)

$V = 1.5 \times 4 = 6V$ $R = V / I$
$I = 2 A$ $R = 6V / 2A$
$R = ?$ $R = 3 \, \Omega$

9. What happens to the current in a circuit if a 1.5- volt battery is removed and replaced by a 9-volt battery?
> The current would increase.

10. The relationship between resistance and current in a circuit is that the greater the resistance the less the current and the greater the current the less the resistance is.

11. The relationship between voltage and current in a circuit is that the greater the voltage the greater the current and vice versa.

12. What could you do to a closed circuit consisting of 2 batteries, 2 light bulbs and a switch to INCREASE the current?

Put the light bulbs in parallel. Each bulb would get the full amount of voltage from the batteries drawing more current.

13. What could you do to a closed circuit consisting of 2 batteries, 2 light bulbs and a switch to DESCREASE the current?

Put the bulbs in series. The voltage would be divdied up between the 2 light bulbs and would draw less current.

14. Circuit A has a 6 volt source, circuit B has a 12 volt source. Both circuits are wired the same which one has the brighter lights? Explain why using the terms electric potential and current.

The circuit with the 12 volt source has the brighter lights because when you increase the voltage you are increasing the amount of electrons that are flowing through the circuit, which also increases the speed at which they are flowing (current).

15. How many 1.5V batteries would be needed to power a circuit containing 3 amps of current and 6 ohms of resistance?

$V = I \times R$
$V = 3A \times 6$
$V = 18$ volts
18 volts/ 1.5 V = 12 batteries