Electric Circuits
Physics First Honors 2010/11

Name _____

Circuits Review

1. What is meant by a complete circuit?
   A conducting Path From The "+" to the "-" Terminal of a Battery (or Power supply)
2. Find the missing quantities in each of the following:
   a) Potential difference is 120 V and the current is 25 A, what is the resistance?
   $R = \frac{V}{I} = \frac{120}{25} =$
   b) R = 30 Ω and the battery supplies 1.5 V, What it the current?
   $I = \frac{V}{R} = \frac{1.5}{30} =$
   c) If a 6 A current flows through a circuit with 100 Ω resistance, what is the potential difference across the circuit?
   $V = I \cdot R = 6(100) = 600$ Volts
3. a) Would you be hurt if you fell from a building but arrested you fall by catching hold of just one high voltage power line? Explain your answer.
   No There is No Potential difference along 1 power line

   b) Would it make a difference if the line sagged until your feet touched the ground? Explain your answer. YES, once grounded you have ΔV

X Is the current from the outlets in your home AC or DC? AC

X ~~4~~) In the circuits in you home who supplies the electrons that vibrate in your wires, you or the power company?

~~b~~) Who supplies the energy that sets the electrons vibrating?

6. a) What type of current is supplied by batteries such as those found in your car or a flashlight? D.C.
   b) What are some possible sources of voltage? Power Supply, Battery, Solar

   c) What causes charges to move through a conductor?
   Potential difference
   d) What are the appropriate units for voltage, current, resistance and power?
   V → Volts (V)
   I → Amps (A)
   R → ohms (Ω)
   P → Watts (W)

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7. Find the missing quantities in each of the following:
   a) What would the current be through a 102 W bulb that operated on a 120 v source?
   $I = \frac{P}{V}$
   $P = IV$
   $\frac{102}{120} = 0.85$ A
   b) What is the power rating for a television that operates on 120 V at 5A?
   $P = IV = 120(5) = 600$ W
   c) What is the voltage across a 70 W light bulb that has a current of 2 A?
   $V = P/I = 70/2 = 35$ Volts

8. What are the rules for a series circuit?

9. What are the rules for a parallel circuit?

11. Are the appliances in you home wired in parallel or series? How do you know?
   Parallel, One turns off all the others stay on
   They all operate @ 120 Volts

12. Why are fuses usually placed in a series between the power supply and a parallel circuit?
   To Protect The circuit from overloads

13. For the following questions assume all the resistors have the same resistance
   In the following circuits:
   a) Which bulb in each circuit would have the most current?
   b) Which circuit has the largest total resistance? A
   c) Which circuit has the largest total current? C