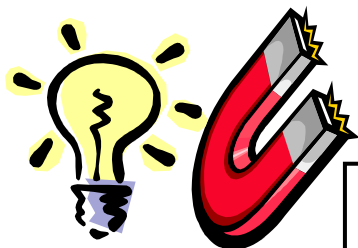


Science 10-Electricity & Magnetism

Activity 7

**Review Sheet on Chapter 3
Static and Current Electricity**



10

Name _____

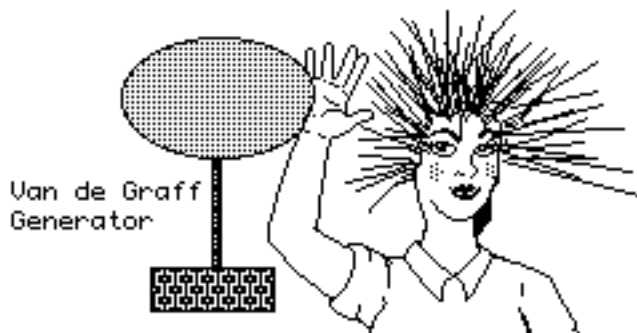
Due Date _____

Show Me Hand In

Correct and Hand In Again By _____

1. What is meant by a **static charge**? _____

2. Use the following diagram to answer the questions below:



a) Explain why the girl's hair sticks out when she touches the charged Van de Graff generator. _____

b) Why is the girl probably standing on a plastic box rather than right on the floor? _____

c) What might happen if the girl got her left hand close to a water tap or other grounded object? _____

Explain why this would happen? _____

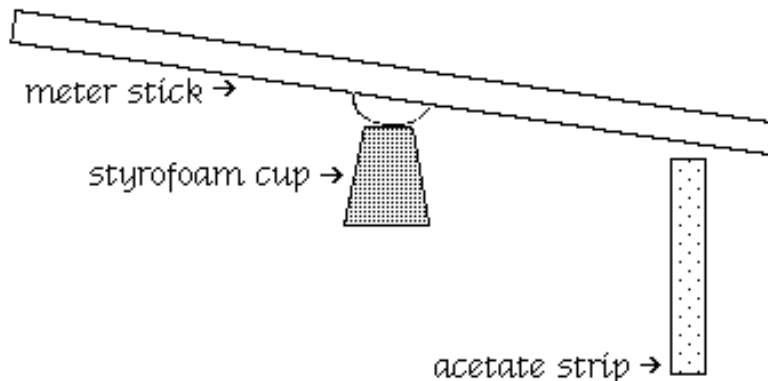
d) What will happen to puffed rice when it is thrown onto the Van de Graff

generator? _____

Explain why this happens _____

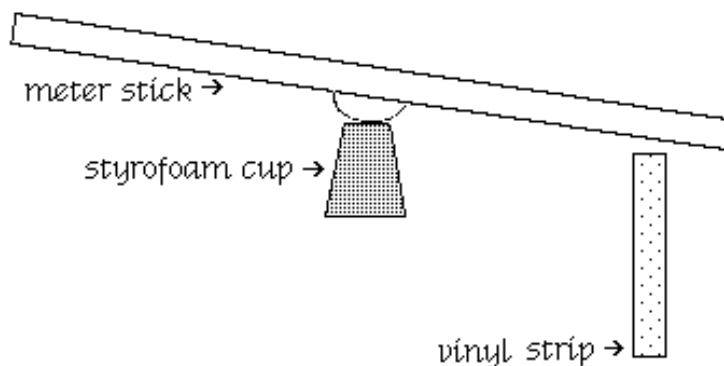
3. An **acetate** strip rubbed with cotton is said to have a _____ charge.
4. An **vinyl** strip rubbed with wool is said to have a _____ charge.
5. An object is attracted to a positively charged strip. This tells us that the object is _____
6. An object is attracted to a negatively charged strip. This tells us that the object is _____
7. An object is repelled by a positively charged strip. This tells us that the object is _____
8. Something which has a **negative** charge is said to have _____ electrons than protons.
9. Something which has a **positive** charge is said to have _____ electrons than protons.
10. Opposite charges _____, like charges _____, and charged objects _____ neutral objects.
11. Explain why a positively charged object will bend a stream of water coming from a water tap when held near. Use a diagram in your explanation. Use the concept of **induced charges**.

12. Given the following diagram:



- Draw the charges on the acetate strip. (Show that there are more “+”s than “-”s.)
- Draw + and - charges on the meter stick, showing how they would behave when the acetate strip is brought near. (Remember, electrons move but protons don’t.)
- The meter stick and the acetate strip will _____ each other.
- What is the purpose of the styrofoam cup? _____

13. Given the following diagram:



- Draw the charges on the vinyl strip. (Remember, there are more “-”s than “+”s.)
- Draw + and - charges on the meter stick, showing how they would behave when the vinyl strip is brought near.
- The meter stick and the vinyl strip will _____ each other.

14. Name some devices which use the principles of static electricity. _____

15. The stored energy of electrons is called _____ energy.
16. A **chemical cell** produces a _____ in electrical potential between two terminals.
17. **Voltage** is the _____
 per _____ of charge. (See page 50 of Text.)
18. What is meant by **conventional current**? _____

19. How is conventional current different from the actual flow of electrons?

20. One **coulomb** is the charge carried by _____ electrons.
 (See page 49 of the Textbook.)
21. One **ampere** is a flow of one _____ per _____.
 (See page 54 of the Textbook.)
22. One **milliampere** = _____ amperes
23. One **ampere** = _____ milliamperes
24. Make the following conversions between amperes and milliamperes:
- a) 450 mA = _____ A d) 0.00025 A = _____ mA
 b) 900 mA = _____ A e) 2.0 A = _____ mA
 c) 5.0 mA = _____ A f) 300.0 A = _____ mA
25. A device used to measure electrical current is called an _____.

26. Draw a circuit diagram showing a single dry cell, a switch, an ammeter and two light bulbs in **series**. Make sure you use the symbols shown on page 55 of the textbook!
27. Draw a circuit diagram showing a single dry cell, a switch, an ammeter and two light bulbs in **parallel**. Make sure you use the symbols shown on page 55 of the textbook!
28. What happens to the current in a circuit when one bulb is replaced by two bulbs in **series**? _____
29. What happens to the current in a circuit when one bulb is replaced by two bulbs in **parallel**? _____
30. Give one **advantage** of having bulbs arranged in **series** in the same circuit.

31. Give one **disadvantage** of having bulbs arranged in **series** in the same circuit.

32. Why could connecting home appliances in **series** be a problem? _____

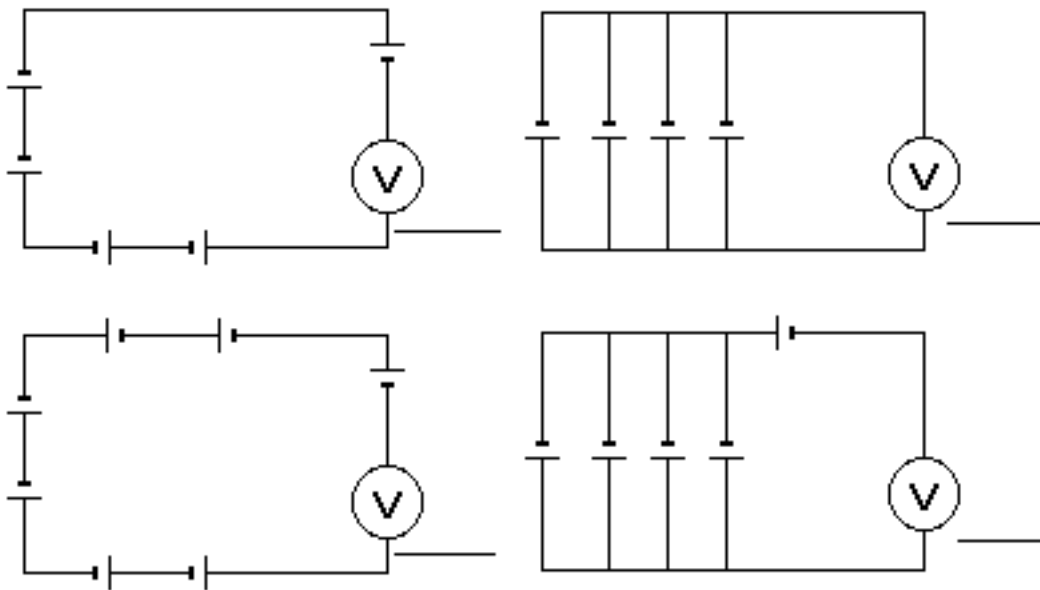
33. What happens to the voltage supplied by a battery when one 1.5 v cell is replaced by two 1.5 v cells in **series**. _____

34. What happens to the voltage supplied by a battery when one 1.5 v cell is replaced by two 1.5 v cells in **parallel**. _____

35. How could we make a battery of 1.5 v cells to produce a voltage of **12 v**?

36. What would be the advantage of having cells in **parallel**? _____

37. Given that each cell in the following diagram has a voltage of 1.5 v, predict the voltage which would be read on each voltmeter. Write the **voltage** in the space below each voltmeter.



38. Draw a circuit diagram showing **ten** 1.5 volt cells arranged in a way which would supply a voltage of **7.5 volts**.

39. What is meant by a **resistor**? _____

40. Most resistors in electrical circuits are made from _____.

41. Another name for a **variable resistor** is a _____.

42. If the voltage of a circuit is held constant and the resistance is increased, what will happen to the **current**? _____

43. **Resistance** is measured in units called _____, and the symbol is _____.

44. Write equations for the three forms of **Ohm's Law** using the symbols V, I and R.

45. A light bulb draws a current of 0.5 A with a voltage of 9.0 volts. Calculate the **resistance** of the bulb.

Answer _____

46. An electric kettle draws a current of 12.5 amperes when a voltage of 110 volts is applied. Calculate the **resistance** of the kettle.

Answer _____

47. A toaster has a resistance of $15.0\ \Omega$. What **current** will the toaster draw using a voltage of 120 volts?

Answer _____

48. A TV has a resistance of 66.67Ω . If 120 volts is used to operate the TV, calculate the **current** flowing through the TV.

Answer _____

49. A Current of 2.4 A passes through a resistor which has 50Ω of resistance. Calculate the **voltage** across the resistor.

Answer _____

50. A 2000Ω resistor has a current of 300 mA. Calculate the **voltage** across the resistor.
(Hint: Don't forget to change mA to A first!)

Answer _____

51. A voltage of 3.0 volts is applied to a 2200Ω resistor. Calculate the **current** through the resistor.

Answer _____Amperes

Answer _____mA

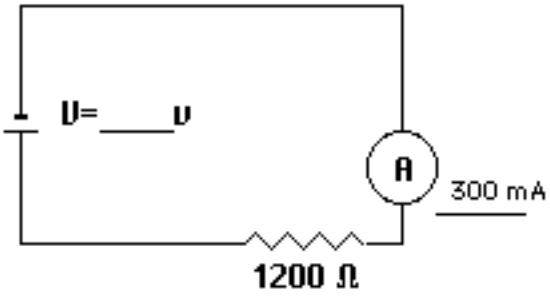
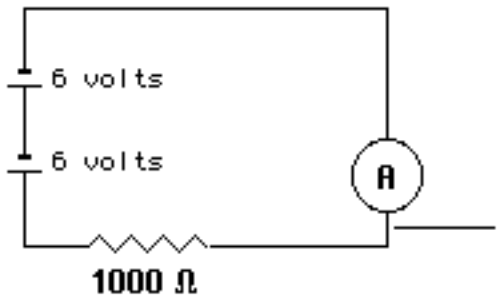
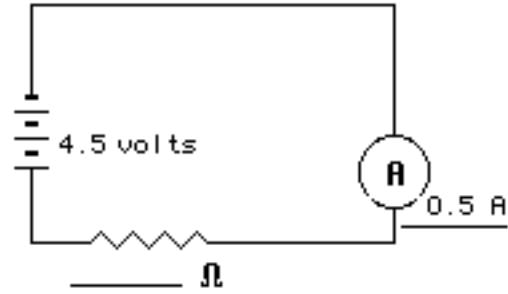
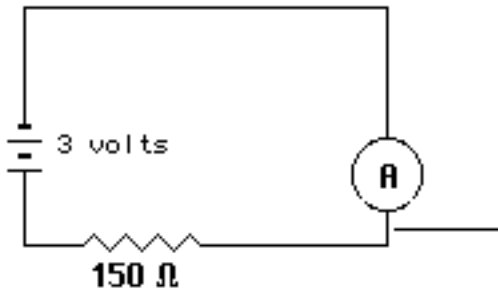
52. A current of 250 mA is measured through a 1000Ω resistor. Calculate the **voltage** across the resistor.

Answer _____

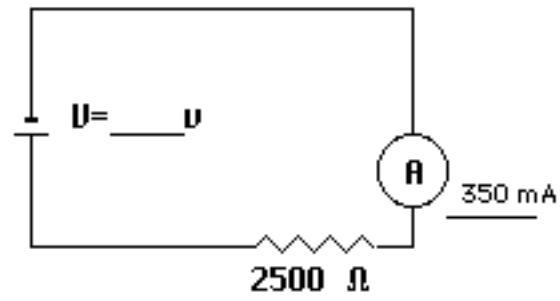
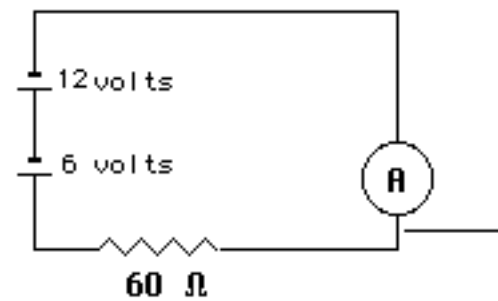
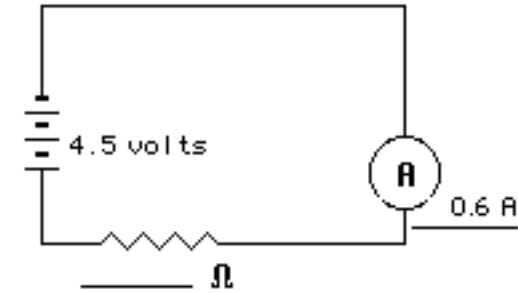
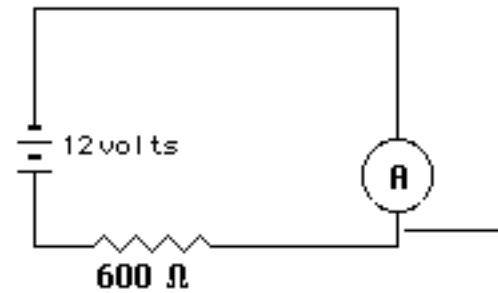
53. A current of 200 mA is measured through a resistor which has a voltage of 5.0 volts. Calculate the **resistance** of the resistor in ohms.

Answer _____

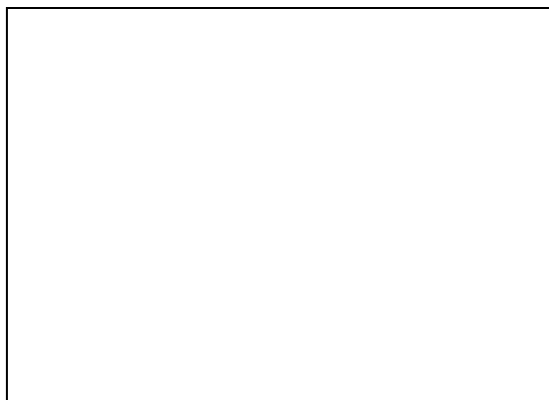
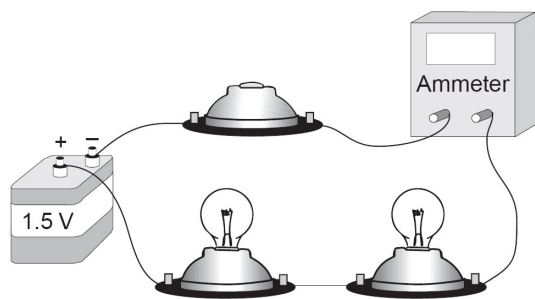
54. Find the unknown values in the following circuits:



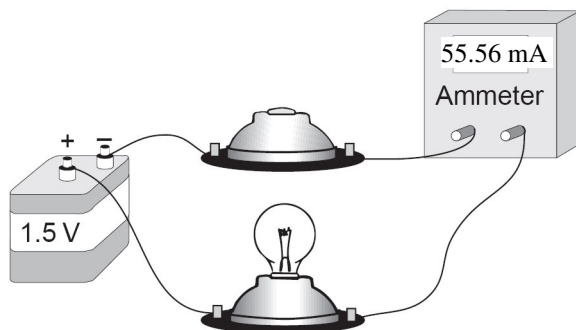
55. Find the unknown values in the following circuits:



56. Given the following diagram, sketch a conventional circuit diagram:



57. Given the following diagram:



If the ammeter shows 55.56 mA, what is the value for the resistance? _____

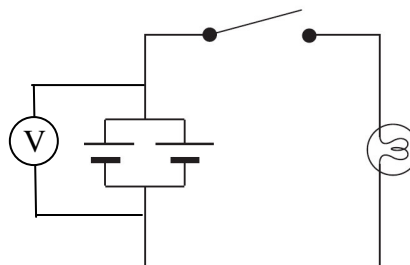
58. Given the following:

Assume that each cell has a voltage of 1.5 V

a) Calculate the voltage that would show on the voltmeter. _____ V

b) Is the bulb lit up? _____ If not, what would we have to do in order to make the light bulb light up?

c) What would be an advantage to having cells connected in this fashion?

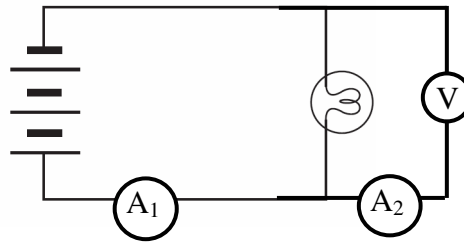


59. Given the following:

The voltage of each individual Cell is 1.5 V

The resistance of the lamp is 11.9Ω

Calculate the current flowing through ammeter A_1

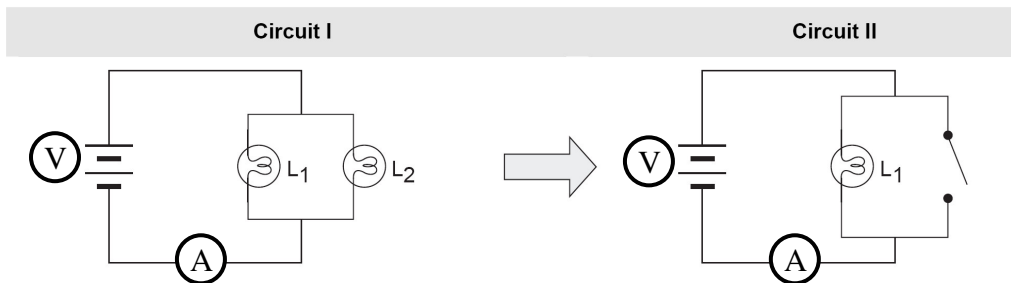


Answer _____ A

_____ mA

What is the current flowing through ammeter A_2 ? Answer _____ A

60. Given:

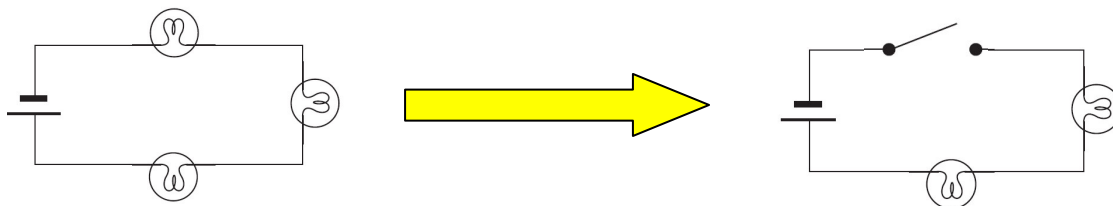


When Lamp L_2 is replaced by an open switch, what happens to the voltage in V? _____

When Lamp L_2 is replaced by an open switch, what happens to the current in A? _____

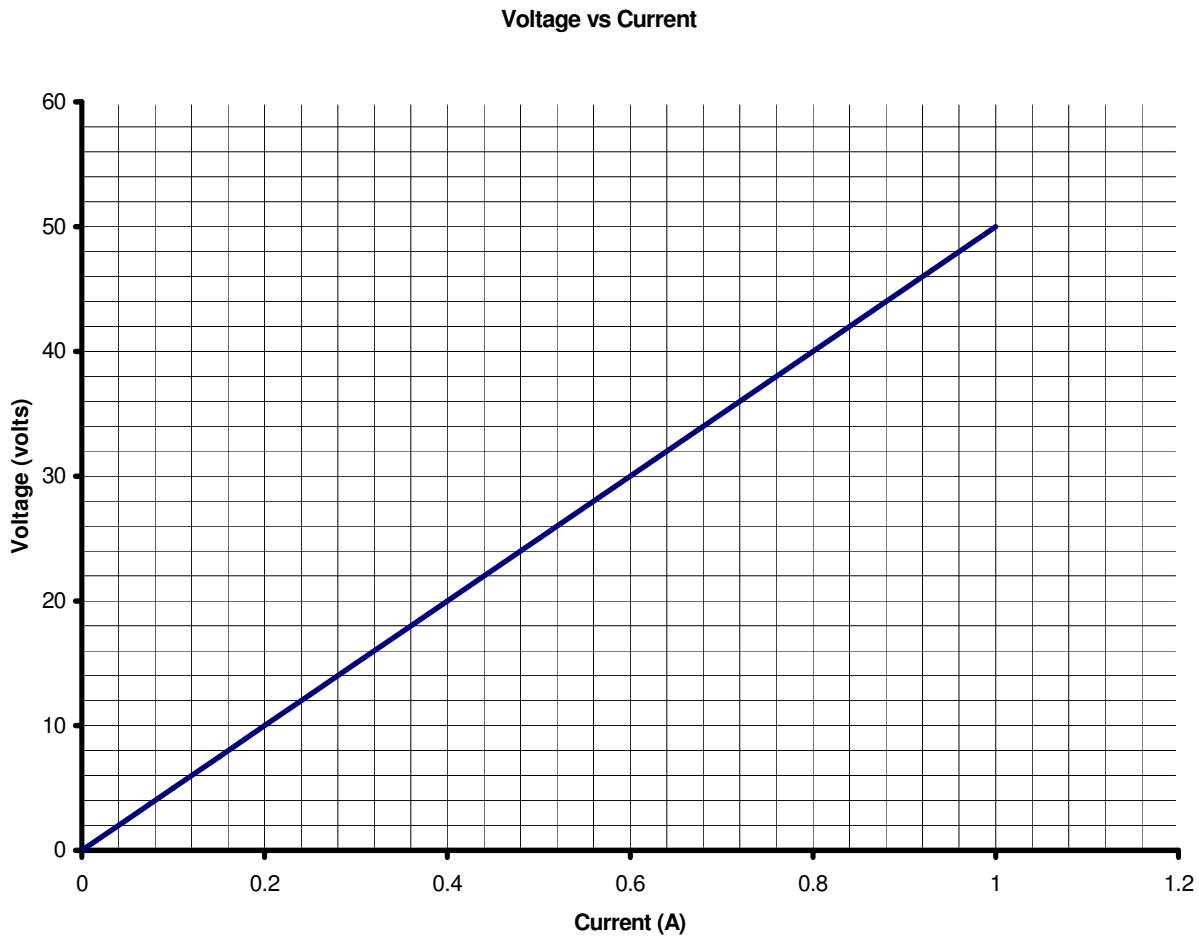
When Lamp L_2 is replaced by an open switch, what happens the brightness of Lamp L_1 ? _____

61.



When one of the lamps is replaced by an open switch, what will happen to the current going through the other light bulbs? _____

62. Given the following graph of Voltage across a resistor vs. Current through the resistor:



a) Calculate the resistance of the resistor used in this experiment.

Answer _____ Ω

b) If a Voltage of 300 volts is applied to the resistor, what would the current through it be?

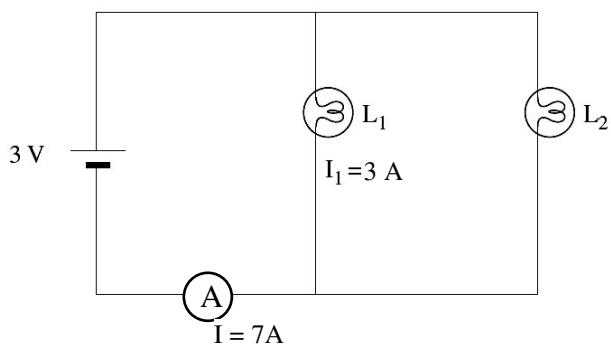
Answer _____ A or _____ mA

c) What voltage would be needed to result in a current of 4.5 A?

_____ V

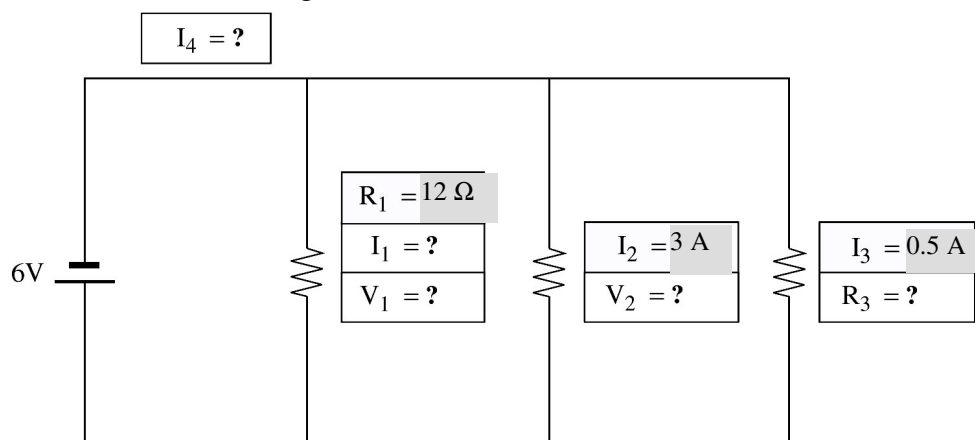
d) The slope of a Voltage vs. Current graph gives you the value for _____

63. Given the following circuit:



- a) Calculate the Resistance of L_1 .
- b) Calculate the Resistance of L_2 .

64. Given the following circuit:



a) $V_1 = ?$ volts

Answer _____ volts

b) $I_1 = ?$ A

Answer _____ A

c) $V_2 = ?$ volts

Answer _____ volts

d) $R_3 = ? \Omega$

Answer _____ Ω

e) $I_4 = ?$ A

Answer _____ A