

Name _____ # _____ Date _____

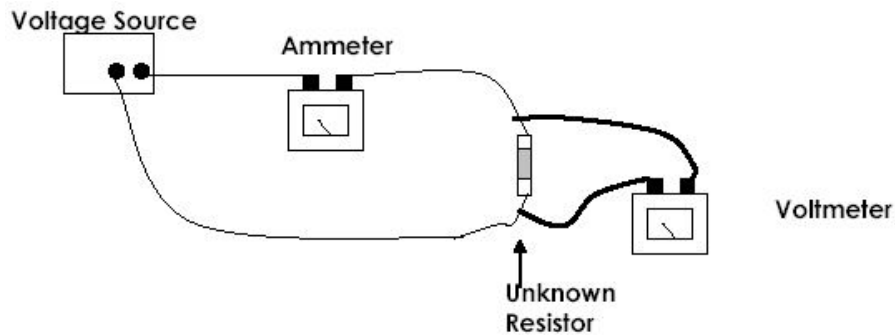
Name _____ # _____ Section # _____

Name _____ # _____

Series Circuit Lab

I. Constructing Series Circuit #1 - Unknown Resistor

Construct the series circuit below



Important:

Reverse terminal connections if meter needle moves backward

***** Important!! Reading the scales: *****

Voltmeter - Read middle scale

Ammeter - Read lower scale

Small divisions on Voltmeter = _____ Small divisions on Ammeter = _____

Ohm's Law: Voltage = Current X Resistance ($V = I R$) (3 points each)

Voltage (Volts)	Measured Current (Amps)	Resistance (Ohms)
6		
5		
4		
3		
0		

Average Resistance Value: _____ ohms (2 points)

Follow-up Questions

1. According to Ohm's Law, what is the mathematical relationship between voltage and current? (4 points)

Direct?

Direct Square?

Inverse?

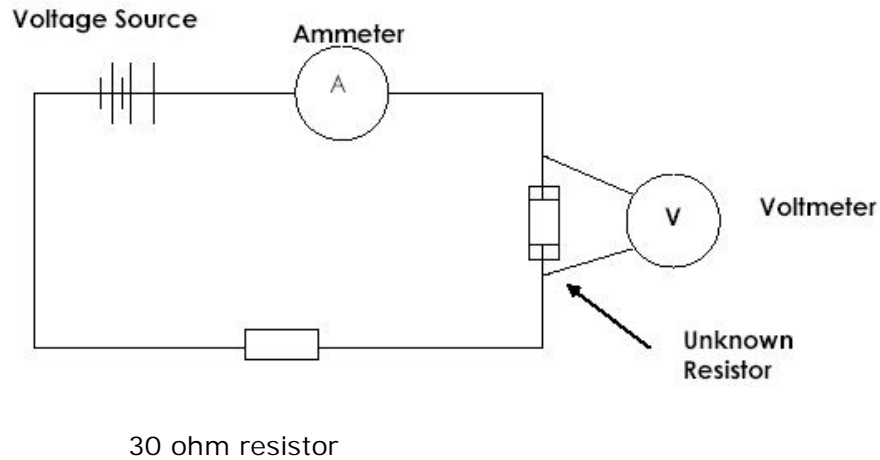
Inverse Square?

2. How much current would you have gotten if you could have raised your voltage to 12 V? Explain your answer using an equation. (4 points)

3. If you plotted your Voltage versus Current data what do you predict the general shape of your plot would be? (4 points)

II. Constructing Series Circuit #2 – 2 Resistors in connected in series

What is the size of the resistance of your second resistor? _____ ohms



Voltage and Current Readings

Look up the series circuit equations in your reference table. Write them below. **(4 points)**

Current Readings (3 points each)

Total Current (I_T) (amps)	Current in Unknown Resistor (I_1) (amps)	Current in 30 ohm resistor (I_2) (amps)

B. Voltage Readings

DON'T MEASURE THE TOTAL VOLTAGE WITH METER – USE A SERIES CIRCUIT EQUATION!!!!

(4 points each)

Measured Voltage in Unknown Resistor (V_1)	Measured Voltage in 30 ohm Resistor (V_2)	(V_T) (Calculated from <u>Equation on your reference table</u>)
_____ volts	_____ volts	_____ volts

C. Finding total resistance using 2 methods**Method #1** - Use $V_T = I_T R_T$ to find R_T (4 points) (Show all work)

Total Voltage from Source (V_T) (See Table Above)	Total Current from Source (I_T) (See previous page)	Total Resistance (R_T) (Calculate) (4 points)

Method #2 - Use $R_T = R_1 + R_2$ to find R_T _____ ohms (4 points) (Show all work below)

1) If you added another resistor to this circuit, what effect would it have on the size of the total current? (3 points)

a) Use a relevant equation to explain why (6 points)

2) If the total voltage supplied to your circuit remained unchanged, how much resistance must be added to your circuit to achieve a total current of .1 amperes? (Show all work) (6 points)