INTRODUCTION TO THE LABORATORY
PHYSICS 183

Name_____Date_____Section_____

Complete the following exercises and turn in at the next lab session.

SHOW ALL WORK FOR PARTIAL CREDIT

1A. Write the following numbers in scientific notation

12345.0 12.345 123.45 0.012345 0.000012345

1B. Give the number of significant digits in the following numbers.

123450 123.0 0.0123450 0.12345 12345.

2A. Add the following two numbers together. Keep the correct number of significant digits in the answer, round off properly if necessary, and then re-write the result in scientific notation.

1233.456 + 1.23467

Answer in decimal form _____

Answer in scientific notation form_____

2B. Subtract the following two numbers. Keep the correct number of significant digits in the answer, round off properly if necessary, and then re-write the result in scientific notation.

1233.456 - 1.23467

Answer in decimal form _____

Answer in scientific notation form_____

3A. Multiply the following two numbers. Keep the correct number of significant digits in the answer, round off properly if necessary, and then re-write the result in scientific notation.

1233.456 X 5.23467

Answer in decimal form _____

Answer in scientific notation_____

3B. Divide the following two numbers. Keep the correct number of significant digits in the answer, round off properly if necessary, and then re-write the result in scientific notation.

1233.456 / 5.23467

Answer in decimal form _____
Answer in scientific notation form_____

Propagation of errors

4A. Object is _____

1. **Smallest increment on ruler_____(m)**
2. **Length of side 1 {L1}_____(m)**
3. **Length of side 2_{L2}_____(m)**
4. **Error in Length of side 1_{ΔL1}_____(m)**
5. **Error in Length of side 2 {ΔL2}_____(m)**
6. **Sum of side 1 and 2 (Include error) _____(m)**
7. **Difference Sides 1 and 2(Include error)_____(m)**

4B. Area

Calculate Area and error in Area of the side of object containing Sides 1 and 2.

Area and error in Area of the side of object_____(m^2)

Time

5A. Number of heat beats in 1 minute_____

5B. Heartbeats per second_____(Hb/s)

5C. Seconds per heartbeat_____(s/Hb)

6 Estimation

6A. Estimated length of your hand span_____(m)

6B. Number of spans for long side of lab table._____

6C. Estimated length of long side of lab Table_____(m)

5D. Actual length of Lab Table (Using 2m stick)_____(m)

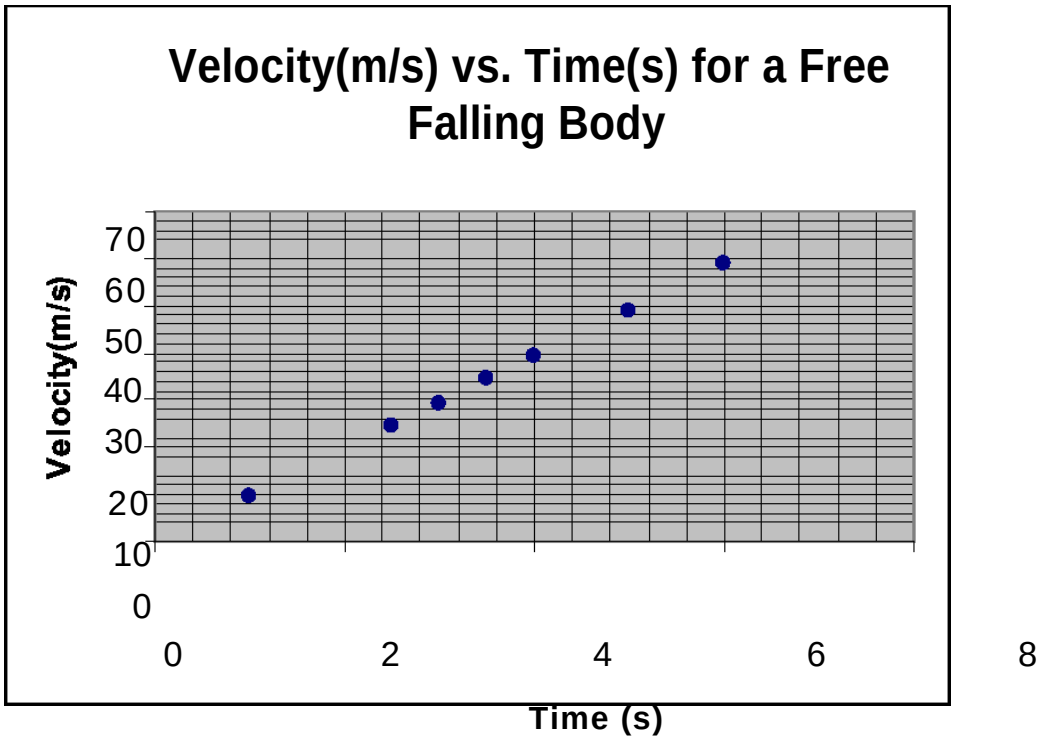
6E. Estimated length of your stride_____(m)

6F. Number of strides for length of Lab Room._____

6G. Estimated length of length of Lab Room _____(m)

5H. Actual length of Lab Room (Using 2m stick)_____(m)

7. Find the average of the following six numbers. Find the standard deviation Keep the correct number of significant digits in the answer, round off properly if necessary.
1.102, 10.23, 2.56236, 5.69, 20.2, 8.56



10. Graphs

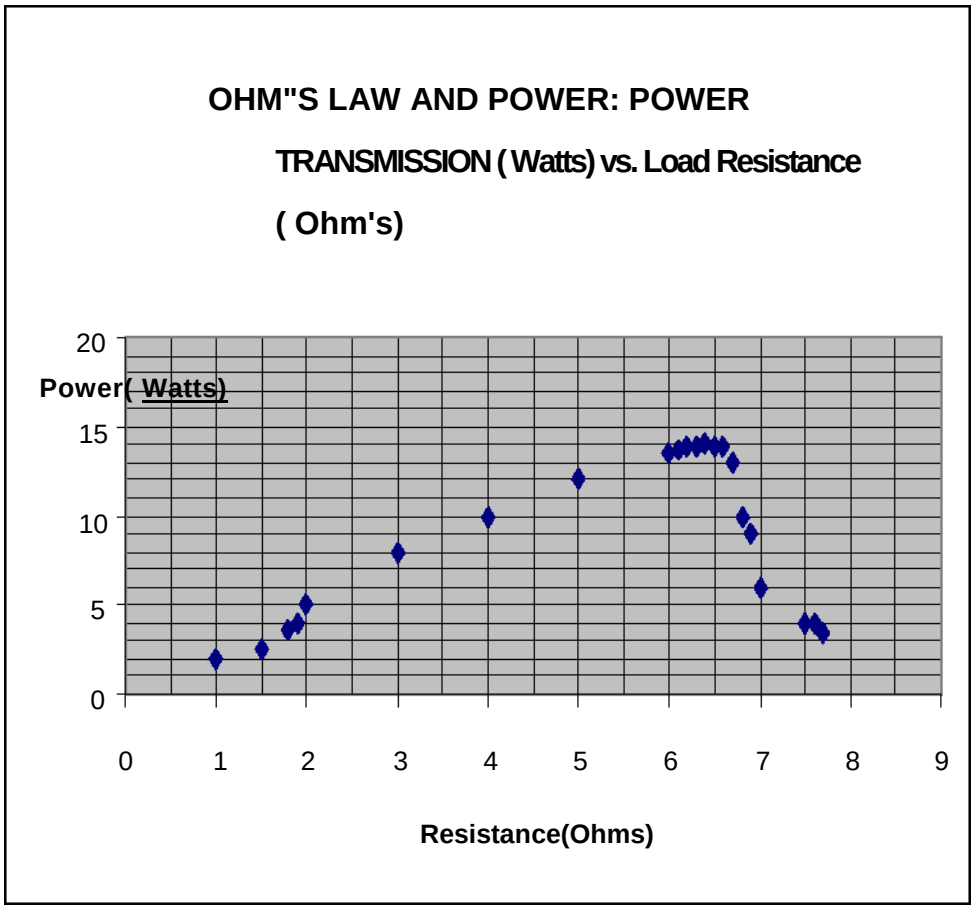
Above is a graph of the Velocity of a free falling body as a function of time. Draw a "Best Fit". straight line through the data points. (THIS IS NOT CONNECT THE DOTS)

Use your ruler to draw the line. Find the slope of the straight line using the

following formula

$$\text{Slope} = (Y2-Y1)/(X2-X1)$$

The two points (X2,Y2) and (X1,Y1) are points on the line. HOWEVER THEY ARE NOT ORIGINAL DATA POINTS. The two points should also be at opposite ends of the line.



Draw Smooth curve through this plotted data. AGAIN THIS IS NOT CONNECTING THE DOTS. The Maximum Power is transferred at what resistance _____?