

Name _____ Date _____

Experiment #0: Density of a Geometric Shape and Linear Graph

Objective To practice measuring, recording, analyzing, and reporting results from measuring density of a geometric shape

Tools Ruler, Vernier caliper, micrometer, weight scale

Instruction

1. Measure mass of the object
2. Measure Lengths of the object
3. Calculate volume of the object using appropriate formula
4. Calculate density of the object using $\rho = \frac{m}{V}$
5. Report the result with acceptable significant figures and uncertainty

Part 1: Density of a Geometric Shape**Experimental results**

Object 1: Unknown material tubing

Mass: _____ 29.594 ± 0.001 _____ (_____ g _____)

Tools used: Ruler

No.	Internal Diameter (r), cm	External Diameter (R), cm	Height (h), cm	
1	3.0 ± _____	1.8 ± _____	2.2 ± _____	
2	2.9 ± _____	1.9 ± _____	2.2 ± _____	
3	3.1 ± _____	1.7 ± _____	2.2 ± _____	
4	2.9 ± _____	1.7 ± _____	2.2 ± _____	
5	3.0 ± _____	1.9 ± _____	2.2 ± _____	
<i>x</i>				

Object 1 Volume Calculation

$$V = \text{_____} \text{ (_____)}$$

Object 1 Density Calculation

$$\rho = \text{_____} \text{ (_____)}$$

Object 2: Metal Washer

Mass: 10.9 ± 0.1 (g)

Tools used: Vernier caliper for r, R and Micrometer for h

No.	Internal Diameter (r), mm	External Diameter (R), mm	Height (h), mm	
1	$10.70 \pm$ _____	$28.02 \pm$ _____	$2.68 \pm$ _____	
2	$10.72 \pm$ _____	$28.12 \pm$ _____	$2.63 \pm$ _____	
3	$10.74 \pm$ _____	$28.08 \pm$ _____	$2.68 \pm$ _____	
4	$10.68 \pm$ _____	$28.14 \pm$ _____	$2.67 \pm$ _____	
5	$10.74 \pm$ _____	$28.12 \pm$ _____	$2.68 \pm$ _____	
\bar{x}				

Object 2 Volume Calculation

$$V = \text{_____} \text{ (_____)}$$

Object 2 Density Calculation

$$\rho = \text{_____} \text{ (_____)}$$

Part 2: Linear Graph

I. Write a linear graph of variable position x (m) as vertical axis and time t (s) as horizontal axis. Use included graph paper.

t (s)	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0
x (m)	38	78	94	113	141	170	190	230

Use 10% uncertainty for variable position x

II. Calculate the slope of this graph with uncertainty and unit. For uncertainty use maximum and minimum slope technique