Name: _____ Date: _____

1. The degree of agreement among several measurements of the same quantity is called _____. It reflects the reproducibility of a given type of measurement.
   A) accuracy
   B) error
   C) precision
   D) significance
   E) certainty

2. The agreement of a particular value with the true value is called
   A) accuracy.
   B) error.
   C) precision.
   D) significance.
   E) certainty.

3. What is the mass of 8 atom(s) of copper in grams?
   A) 508.4 g
   B) 1.18e21 g
   C) 4.78e24 g
   D) 6.022e23 g
   E) 8.44e–22 g

4. Calculate the mass of 6.022×10^{23} atoms of Aluminum. Show set up. Answer must be expressed with the proper number of significant figures.

5. Calculate the mass of .658 moles of Fe atoms. Show setup. Answer must be expressed with the proper number of significant figures.

6. Calculate the number of atoms in 3.78 moles of the element Zinc. Show setup. Express answer with proper number of significant figures.

Name: _____ Date: _____

1. Which of the following metric relationships is incorrect?
   A) 1 microliter = 10^{-6} liters
   B) 1 gram = 10^{3} kilograms
   C) 10^{3} milliliters = 1 liter
   D) 1 gram = 10^{2} centigrams
   E) 10 decimeters = 1 meter

2. Express 0.00560 in exponential notation.
   A) 5.60×10^{3}
   B) 5.6×10^{-3}
   C) 5.60×10^{-3}
   D) 5.60
   E) none of these

3. Which of the following is the least probable concerning five measurements taken in the lab?
   A) The measurements are accurate and precise.
   B) The measurements are accurate but not precise.
   C) The measurements are precise but not accurate.
   D) The measurements are neither accurate nor precise.
   E) All of these are equally probable.

4. The amount of uncertainty in a measured quantity is determined by:
   A) both the skill of the observer and the limitations of the measuring instrument.
   B) neither the skill of the observer nor the limitations of the measuring instrument.
   C) the limitations of the measuring instrument only.
   D) the skill of the observer only.
   E) none of these

5. A scientist obtains the number 0.045006700 on a calculator. If this number actually has four (4) significant figures, how should it be written?
   A) 0.4567
   B) 0.4501
   C) 0.045
   D) 0.04500
   E) 0.04501

Name _____ Date _____ Class _____

PROBLEMS Write the answers to the questions on the line to the left, and show your work in the space provided. Express each answer to the correct number of significant digits.

36. _____ The mass of a 5.00 cm^3 sample of clay is 11.0 g. What is the density of the clay?

37. _____ A length measurement is 1.40 cm. The correct value is 1.36 cm. Calculate the percent error.

38. _____ The density of lead is 11.35 g/cm^3. What is the mass of a 10.0 cm^3 piece of lead?

39. _____ What is the volume in liters of a cube whose edge is 4.33 cm long?

40. _____ What is the sum of 3.089 g and 0.07452 g?

Name _____ Date _____ Class _____

SECTION 2-2 continued

3. Use the data found in Table 2-4 on page 38 of the text to answer the following questions:

_____ **a.** If ice were denser than liquid water at 0°C, would it float or sink in water?

_____ **b.** Water and kerosene do not readily dissolve in one another. If the two are mixed, they quickly separate into layers. Which liquid floats on top?

_____ **c.** What other liquids would float on top of water?

_____

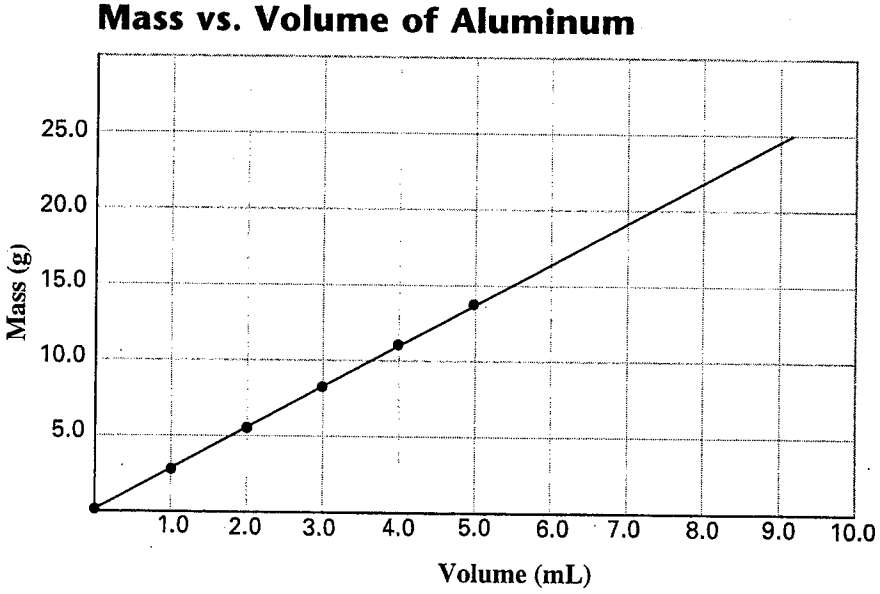
4. Use the graph of the density of aluminum below to determine the approximate mass of aluminum samples with the following volumes.

_____ **a.** 8.0 mL

_____ **b.** 1.50 mL

_____ **c.** 7.25 mL

_____ **d.** 3.50 mL



PROBLEMS **Write the answer on the line to the left. Show all your work in the space provided.**

5. _____ Aluminum has a density of 2.70 g/cm^3. What would be the mass of a sample whose volume is 10.0 cm^3?

6. _____ A certain piece of copper wire is determined to have a mass of 2.00 g per meter. How many centimeters of the wire would be needed to provide 0.28 g of copper?

Name _____ Date _____ Class _____

CHAPTER 2 REVIEW

Measurements and Calculations

SECTION 2-3

SHORT ANSWER **Answer the following questions in the space provided.**

1. Report the number of significant figures in each of the following values:

_____ **a.** 0.002 37 g

_____ **b.** 0.002 037 g

_____ **c.** 350. J

_____ **d.** 64 mL

_____ **e.** 1.3×10^2 cm

_____ **f.** 1.30×10^2 cm

2. Write the value of the following operations using scientific notation:

_____ **a.** $\dfrac{10^3 \times 10^{-6}}{10^{-2}}$

_____ **b.** $\dfrac{8 \times 10^3}{2 \times 10^5}$

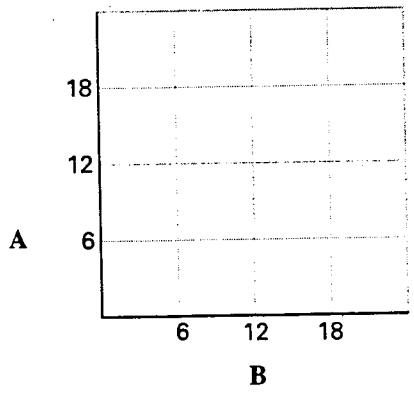
_____ **c.** $3 \times 10^3 + 4.0 \times 10^4$

3. The following data are given for two variables, A and B:

A	B
18	2
9	4
6	6
3	12

_____ **a.** Are A and B directly or inversely proportional?

b. In the graph provided, sketch a plot of data.



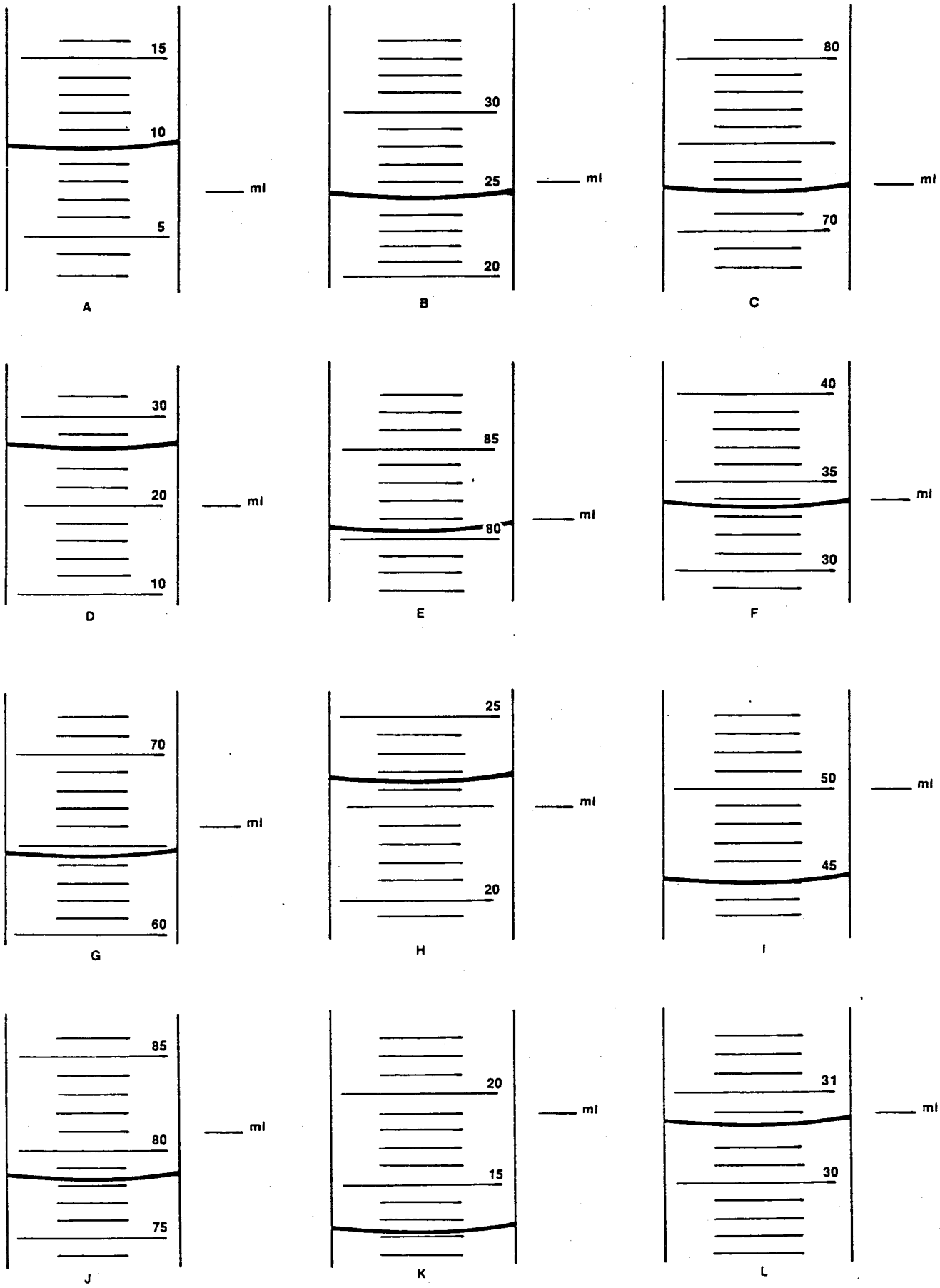
_____ **c.** Do the data points form a straight line?

_____ **d.** Which equation fits the relationship shown by the data?
$A \div B = k$ (a constant) or $A \times B = k$ (a constant)

_____ **e.** What is the value of k?

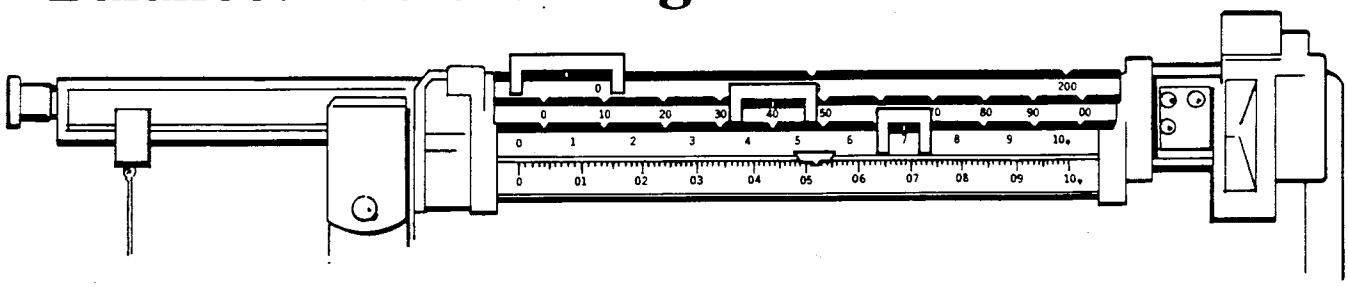
METRIC LAB (VOLUME) SECTION: _____

PRACTICE SHEET 2-2

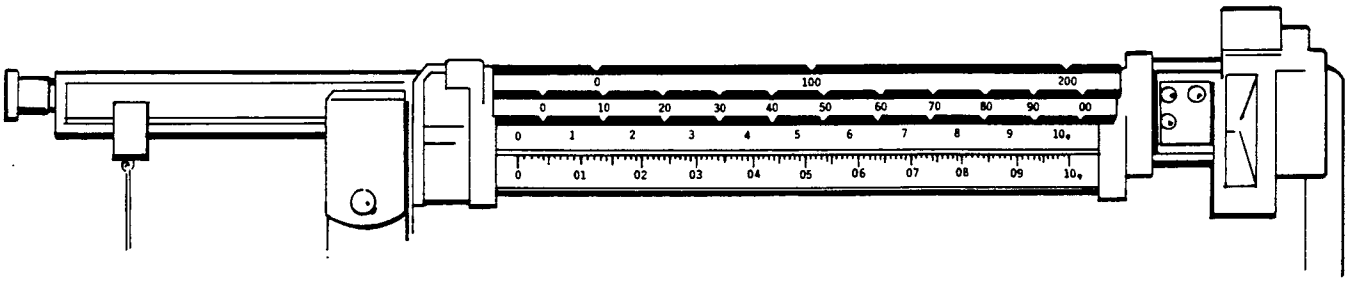


Using Laboratory Measuring Devices

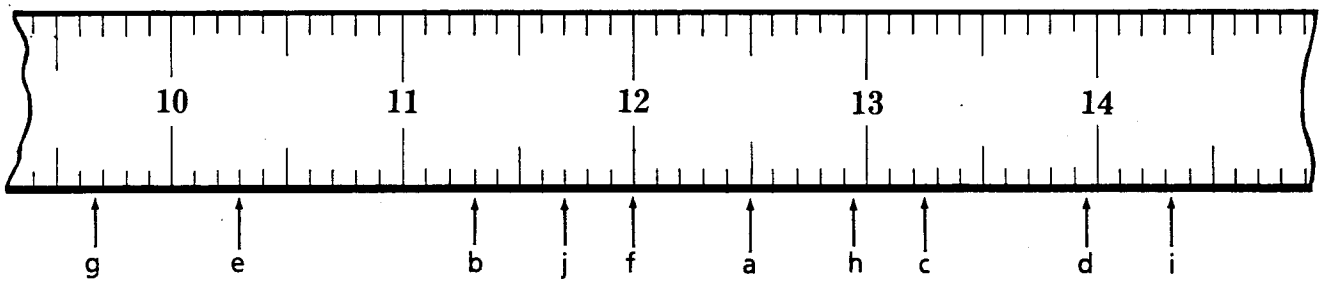
Balance: Determining Mass



The mass of the object would be read as _____.



Metric Ruler: Determining Length



a _____ c _____ e _____ g _____ i _____

b _____ d _____ f _____ h _____ j _____

DATA TABLE:

Sample	Description	Mass (g)	Volume (cm^3)	Density (g/cm^3)	Identity	Number of atoms	{ SINGLE ATOM } Mass (g)	Volume (cm^3)	Diameter (cm)	Radius (cm)	Radius (Å)	Radius (nm)	Radius (pm)
1													
2													
3													
4													
Experi-mental Average													
Literature Value													

$$\text{Percent Error} = \frac{\text{Experimental value} - \text{Literature Value}}{\text{Literature Value}} \times 100\ \%$$

Calculate percent error for: Average Density of the 4 samples
Average radius of a single atom expressed in Å, nm, and pm