

Unit 1 Measurement

Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. The accepted value is 15.63. Which correctly describes this student's experimental data?

Trial	Measurement
1	12.84
2	13.02
3	12.96

- a. accurate but not precise
 b. precise but not accurate
 c. both accurate and precise
 d. neither accurate nor precise

2. Which term is described as the amount of matter in an object?

- a. density
 b. volume
 c. mass
 d. length

3. Which is NOT an appropriate unit for measuring density?

- a. g/cm
 b. g/ml
 c. kg/L
 d. g/L

4. An object has a mass of 26.94 grams and a volume of 2.568 cubic centimeters. What material is it likely to be made of?

Substance	iron	gold	silver	copper
Density (g/cm ³)	7.874	19.32	10.49	8.92

- a. Iron
 b. Gold
 c. Silver
 d. Copper

5. Which value has only 4 significant digits?

- a. 6.930
 b. 0.0450
 c. 8450
 d. 0.392

6. The accepted value for the density of iron is 7.87 g/cm³. A student records the mass of a 20.00-cm³ block of iron as 153.8 grams. What is the percent error for the density measurement?

- a. 19.4%
 b. 7.69%
 c. 2.29%
 d. 2.34%

7. The accepted value for a quantity is 5.67 g. If the measured value is 5.89 g, what is the percent error?

- a. 1.04%
 b. 3.74%
 c. 3.74%
 d. 3.88%

8. Which is the correct value for the prefix *deci*-?

- a. one-tenth
 b. ten
 c. hundred
 d. one-thousandth

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9. Which is the sum of these values, to the appropriate number of significant digits?
 $17.358 + 3.502 + 20.14 =$

- a. 41
- b. 41.00
- c. 41.000
- d. 41.0

10. Which is the product of these numbers, to the appropriate number of significant digits?
 $56.2 \times 9.2057 =$

- a. 517
- b. 517.4
- c. 517.36
- d. 517.00

11. How many significant digits are in the value 530,405,000?

- a. 4
- b. 5
- c. 6
- d. 9

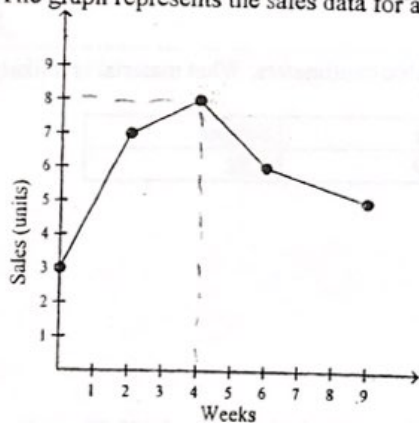
12. How many significant digits are in the value 0.0050340?

- a. 3
- b. 5
- c. 7
- d. 8

13. A bottle contains 3.100 mL of a liquid. The total mass of the bottle and the liquid together is 6.300 g. The mass of the empty bottle is 4.240 g. What is the density of the liquid?

- a. 0.665 g/mL
- b. 1.368 g/mL
- c. 1.505 g/mL
- d. 2.032 g/mL

14. The graph represents the sales data for a particular product. In which week were 8 units sold?



- a. 3rd week
- b. 4th week
- c. 6th week
- d. 9th week

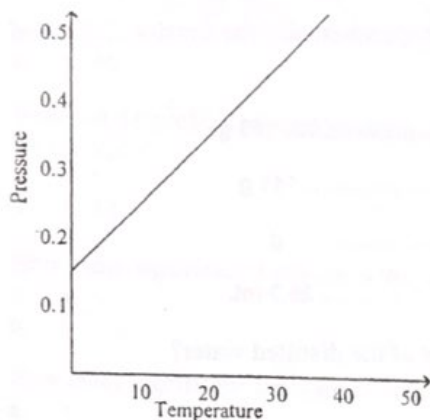
15. The product of 2×10^4 cm and 4×10^{-12} cm, expressed in scientific notation is _____.

- a. 8×10^{-7} cm
- b. 6×10^{-8} cm
- c. 8×10^{-8} cm
- d. 8×10^{-48} cm

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21. Analyze the graph and explain how the pressure of oxygen gas varies with an increase in the temperature.



22. Convert 600 mg to grams.

Problem

23. A vessel contains 30 mL of water. A sample of 5.0 g of copper metal is dropped into this vessel, raising the level of water in it to 40 mL. What is the density of the copper sample?
24. When a 5.00-g metal piece, A, was immersed in 38.0 mL of water, the water level rose to 50.0 mL. Similarly, when a 5.00-g metal piece, B, was immersed in 38.0 mL of water, the level of water rose to 60.0 mL. Compare the density of the metal pieces, A and B.
25. A metal cube has a mass of 54 g and a volume of 20.0 cm³. Is this metal composed of pure aluminum? Support your answer with an explanation.

Name: _____

Answer Sheet for Short Response

17. a _____
b _____
c _____
d _____

18. _____

19. _____

20. _____

21. _____

22. _____

23. _____

24. _____

25. _____

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M.C. Key

Answer Sheet for Short Response

17. a 2
b 1
c 4
d 4

18. Distance had a % error of 5.52%, mass had a % error of 6.70%. So the distance value was more accurate (closer to the accepted).

19. Trial 3

20. $14,000,000 \text{ km} \left(\frac{10^3 \text{ m}}{1 \text{ km}} \right) = 1.4 \times 10^{10} \text{ km}$

21. As temperature increases the pressure of oxygen gas increases.

22. $0.6 \text{ g} \quad 600 \text{ mg} \left(\frac{10^{-3} \text{ g}}{1 \text{ mg}} \right) = 0.6 \text{ g}$

23. $d = \frac{m}{v} = \frac{5.0 \text{ g}}{10 \text{ ml}} = 0.5 \text{ g/ml}$ or 1 g/ml
(rounded for sig figs)

24. A B
 $d = \frac{5.0 \text{ g}}{12.0 \text{ ml}} = 0.417 \text{ g/ml}$ $d = \frac{5.0 \text{ g}}{22.0 \text{ ml}} = 0.227 \text{ g/ml}$

25. $d = \frac{54 \text{ g}}{20.0 \text{ cm}^3} = 2.7 \text{ g/cm}^3$
The density of metal A is greater than the density of metal B.

Yes, because the density of Al on Table S is 2.70 g/cm^3

- 1) d
- 2) c
- 3) a
- 4) c
- 5) a
- 6) c
- 7) d
- 8) a
- 9) b
- 10) a
- 11) c
- 12) b
- 13) a
- 14) b
- 15) c
- 16) c