AP PHYSICS UMEMOTO

NAME	PERIOD

# **UNIT 1 HOMEWORK**

# 1.1 THE METRIC SYSTEM AND SI UNITS

- 1. Convert each of the following length measurements to its equivalent in meters.
  - a. 1.1 cm
  - b. 76.2 pm
  - c. 2.1 km
  - d. 0.123 Mm
- 2. Convert each of the following mass measurements to its equivalent in kilograms.
  - a. 147 g
  - b. 11 μg
  - c. 7.23 Mg
  - d. 478 mg
- 3. Express your age in the following units:
  - a. Years
  - b. Days
  - c. Hours
  - d. Minutes
  - e. Seconds

# 1.2 SCIENTIFIC NOTATION AND SIGNIFICANT DIGITS

- 4. Express each measurement in scientific notation.
  - a. 0.000006 m
  - b. 5,400,000 kg
  - c.  $71 \times 10^3 \text{ s}$
  - d.  $33 \times 10^{-3}$  m
- 5. Express each measurement in standard notation.
  - a.  $0.9 \times 10^{-3} \text{ kg}$
  - b.  $2.5 \times 10^6 \text{ s}$
- 6. Identify the precision of each measurement by stating the number of significant digits.
  - a. 246.32 km
  - b. 1.00 mg
  - c. 0.025 s
  - d. 3000 cm
  - e. 5.60 x 10<sup>-6</sup> g
  - f.  $406 \mu s$
- 7. Solve the following problems by using correct significant digits.
  - a. 6.201 cm + 7.4 cm + 0.68 cm + 12.0 cm
  - b. 4.75 m 0.4168 m
  - c. 3.2145 km x 4.23 km
  - d. 13.78 g ÷ 11.3 g

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### 1.3 GRAPHICAL ANALYSIS

8. The mass values of specified volumes of pure gold nuggets are given in **Table 1-4**.

- a. Plot the mass versus volume from the values given in the table and draw the curve that best fits all points.
- b. Describe the resulting curve in complete sentences. What type of relationship exists between the mass of pure gold nuggets and their volume?
- c. What is the value of the slope of this graph? Include the proper units.
- d. Write the equation showing mass as a function of volume for gold.
- e. Write a sentence that provides a word interpretation of the equation showing mass as a function of volume for gold.
- 9. The speed of an object over given time intervals is given in the following table.

Time (s)	0	5	10	15	20	25	30	35
Speed (m/s)	12	10	8	6	4	2	2	2

- a. Plot the speed versus time from the values given in the table and draw the curve that best fits all points.
- b. Describe the resulting curve in complete sentences. What type of relationship exists between the speed of the object and time?
- c. What is the value of the slope of this graph? Include the proper units.
- d. Write the equation showing speed as a function of time for the moving object.
- e. Write a sentence that provides a word interpretation of the equation showing speed as a function of time for the moving object.

# **1.4 RIGHT TRIANGLE REVIEW**

Using the generic triangle to the right, Right Triangle Trigonometry and Pythagorean Theorem solve the following. Your calculator must be in degree mode.

10.  $\theta = 55^{\circ}$  and c = 32 m, solve for a and b.

11.  $\theta = 45^{\circ}$  and a = 15 m/s, solve for b and c.

12. b = 17.8 m and  $\theta$  = 65°, solve for a and c.

13. a = 250 m and b = 180 m, solve for  $\theta$  and c.

14. a = 25 cm and c = 32 cm, solve for b and  $\theta$ .

15. b = 104 cm and c = 65 cm, solve for a and  $\theta$ .

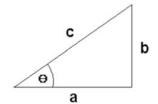


Table 1-4

**Mass of Pure Gold Nuggets** 

Volume (cm<sup>3</sup>)

1.0

2.0

3.0

4.0

5.0

Mass (g)

19.4

38.6

58.1

77.4

96.5