Name: _____

Module 4/ Significant Figures

Worksheet

1. Solve each problem, and express each answer in correct scientific notation and significant figures.

a. $(4.0 \times 10^{7})\ (2.0 \times 10^{-3}) = 8.0 \times 10^{4}$

b. $(6.3 \times 10^{-2}) / 2.1 \times 10^{4} = 3.0 \times 10^{-6}$

c. $(4.6 \times 10^{3}) - (1.8 \times 10^{3}) = 2.8 \times 10^{3}$

d. $(7.1 \times 10^{-2}) + (5 \times 10^{-3}) = 7.6 \times 10^{-2}$

2. Determine the number of significant figures in each measurement.

a. 0.057 30 meter – 4 significant figures

b. 8765 meters – 4 significant figures

c. 0.000 73 meter – 2 significant figures

d. 40.007 meters – 5 significant figures

3. How many significant figures are in each measurement?

a. 143 grams – 3 significant figures

b. 0.074 meter – 2 significant figures

c. 8.750×10^{-2} gram – 4 significant figures

d. 1.072 meters – 4 significant figures

4. Round each measurement to three significant figures. Write your answers in scientific notation.

a. 87.073 meters; 8.71 x 10 meters

b. 4.3621×10^{8} meters; 4.36×10^{8} meters

c. 0.015 52 meter; 1.55×10^{-2} meters

d. 9009 meters; 9.01×10^{3} meters

e. 1.777×10^{-3} meter; 1.78×10^{-3} meters

f. 629.55 meters; 6.30×10^{2} meters

5. Round each measurement in Practice Problem 7 to one significant figure. Write your answers in scientific notation.

a. 9×10 meters b. 4×10^8 meters c. 2×10^{-2} meters

d. 9×10^3 meters e. 2×10^{-3} meters f. 6×10^2 meters

6. Perform each operation. Provide your answers to the correct number of significant figures.

a. 61.2 meters + 9.35 meters + 8.6 meters = 79.2 meters

b. 9.44 meters – 2.11 meters = 7.33 meters

c. 1.36 meters + 10.17 meters = 11.53 meters

d. 34.61 meters – 17.3 meters = 17.3 meters

7. Find the total mass of three diamonds that have masses of 14.2 grams, 8.73 grams and 0.912 gram.

Since the least accurate number of these three (14.2 grams) stops at the tenths place, report your final calculation to the tenths place: 23.8 grams.

8. Solve each problem. Provide your answers to the correct number of significant figures and in scientific notation.

a. 8.3 meters x 2.22 meters = 1.8×10 m^2

b. 8432 meters/ 12.5 = 6.75×10^2 m

c. 35.2 seconds x 1 minute/ 60 seconds = 5.86×10 minutes

9. Calculate the volume of a warehouse that has inside dimensions of 22.4 meters by 11.3 meters by 5.2 meters. (Volume = l x w x h)

1,316.22 m^3 or 1.3×10^3 m^3

10. Explain the differences between *accuracy*, *precision*, and *error* of a measurement.

Accuracy is a measure of how close a measurement is to its true value. Precision is a measurement of how close a series of measurements are to one another. Error is the difference between an accepted value, and experimental value.

11. Determine the number of significant figures in each of the following measurements and calculations results.

a. 12 basketball players; unlimited b. 0.010 square meter; 2 significant figures

c. 507 thumbtacks; unlimited d. 0.070 020 meter; 5 significant figures

e. 10 800 meters; 3 significant figures f. 5.00 cubic meters; 3 significant figures

Problems from Wilbraham, Staley, Matta, & Waterman, (2002). *General Chemistry*, Prentice-Hall.