

Unit 1: Significant Figures and Scientific Notation (Honors)

Answer the following using the correct number of significant figures. Show your work like the examples we did in class.

1) How many significant figures are in each of the following?

a) .0012

d) .0900001

g) 125,904,000

b) 437,000

e) 1.0012

h) 0.001060

c) 900.0

f) 2006

i) 106

2) $(42.16)(.00301) =$

3) $1.315 + 47.3315 =$

4) $(156000.)(.0041) =$

5) $11.74 - .053901 =$

6) $(.12345)(67890) =$

7) $\frac{.5016}{.520} =$

8) $(.00881)(57.07) =$

9) $\frac{.162}{34.9117} =$

10) $716.1 + 3.414 + 109.39 =$

11) $\frac{3901.05}{31.7} =$

12) $(7.69 \times 10^{-5})(9.01 \times 10^5) =$

13) $(3.67 \times 10^2)(2.5 \times 10^8) =$

14) $(36.11)(9.21 \times 10^{-6}) =$

15) $(5.1 \times 10^4)(2.07 \times 10^{-18}) =$

16) $\frac{3.52 \times 10^6}{4.1 \times 10^{-2}} =$

17) $\frac{537.1}{7.42 \times 10^{-12}} =$

18) $\frac{1.18 \times 10^{23}}{3.72 \times 10^{21}} =$

19) $\frac{5.103 \times 10^7}{158.01} =$

20) $\frac{4.39 + 2.11 + 7.01 + 8.61}{7.1} =$

21) $\frac{(5.162 \times 10^{24})(7.27 \times 10^4)}{9.08 \times 10^{15}} =$

22) $\frac{(6.89 \times 10^3)(2.1 \times 10^{-12})}{(631)(9.21 \times 10^5)(3.6 \times 10^8)} =$

23) $\frac{2.526}{3.1} + \frac{0.470}{.623} + \frac{80.705}{.4326} =$

24) $(6.404 \times 2.91) / (18.7 - 17.1)$

25) $\frac{9.5 + 4.1 + 2.8 + 3.175}{4}$

Percent Error Problems: $|\text{Accepted Value} - \text{Experimental Value}| = \text{Error}$

$$\% \text{ Error} = \frac{\text{Error}}{\text{Accepted Value}} \times 100$$

26) Clyde Clumsy was directed to weigh a 50.000 g mass on the balance. After diligently goofing off for ten minutes, he quickly weighed the object and reported 45.899 g. Calculate the % error. **Show all your work!**

27) Willomina Witty was assigned to determine the density of a sample of nickel metal. When she finished, she reported the density of nickel as 5.59 g/ml. However, the teacher said the density of nickel was 6.44 g/ml. Calculate the % error. **Show all your work!**

28).An experiment to determine the volume of a "mole" of a gas was assigned to Barry. He didn't read the experiment carefully and concluded the volume was 18.7 liters. The teacher said he should have obtained 22.4 liters. Calculate the % error. **Show all your work!**

29) John uses his thermometer and finds the boiling point of ethyl alcohol to be 75.1° C. He looks in a reference book and finds that the actual boiling point of ethyl alcohol is 78.0°C. What is his percent error? **Show all your work!**

30) The Handbook of Chemistry and Physics lists the density of a certain liquid to be 0.7988 g/mL. Fred experimentally finds this liquid to have a density of 0.7914 g/mL. The teacher allows up to +/- 0.500% error to make an "A" on the lab. Did Fred make an "A"? Prove your answer. **Show all your work!**