

# Significant Figures

## Discussion Study Sheet

Chem 192  
Cañada College

Name: \_\_\_\_\_

Student ID: \_\_\_\_\_

Date: \_\_\_\_\_

**1.** The four rules of significant figures are (fill in the blank with either “significant” or “not significant”):

- a) All non-zero digits are \_\_\_\_\_ .
- b) A zero is \_\_\_\_\_ when it is between two non-zero digits.
- c) A zero is \_\_\_\_\_ before (left side) of the first nonzero digit.
- d) A zero is \_\_\_\_\_ at the end (right) of a number -- **unless there is a decimal point.**

**2.** Write the number of significant figures for each value below.

- |  |       |   |       |
|--|-------|---|-------|
| a) 62.34 yrs                           | _____ | b) 14.062 s                               | _____ |
| c) 12,001                              | _____ | d) 12,000                                 | _____ |
| e) 12,010                              | _____ | f) 12,000.                                | _____ |
| g) 12,000.1                            | _____ | h) 12,000.0                               | _____ |
| i) 9.206 cm                            | _____ | j) 9.200 in                               | _____ |
| k) 0.092 mi                            | _____ | l) 0.09206                                | _____ |
| m) 0.09200                             | _____ | n) 7 ft                                   | _____ |
| o) 7.2 ft                              | _____ | p) 7 marbles                              | _____ |
| q) $55 \frac{\text{miles}}{\text{hr}}$ | _____ | r) $12 \frac{\text{inches}}{\text{foot}}$ | _____ |

**3.** Write each of the following measurements in scientific notation.

a) 62.34 yrs

\_\_\_\_\_

b) 12,001 ft

\_\_\_\_\_

c) 12,000 ft

\_\_\_\_\_

d) 12,000. ft

\_\_\_\_\_

e) 7 inches

\_\_\_\_\_

f) 0.092 mi

\_\_\_\_\_

g) 0.09200 mi

\_\_\_\_\_

h) 0.007409 km

\_\_\_\_\_

i) 40 degrees

\_\_\_\_\_

j) 7.2 ft

\_\_\_\_\_

k)  $55 \frac{\text{miles}}{\text{hr}}$

\_\_\_\_\_

**4.** Round off each number below to 4 sig figs and express it in 4 significant figures.

a) 74.814

\_\_\_\_\_

b) 0.192631

\_\_\_\_\_

c) 204.036

\_\_\_\_\_

d) 23.72709

\_\_\_\_\_

e) 12,010

\_\_\_\_\_

f) 0.979962

\_\_\_\_\_

g) 12,000.1

\_\_\_\_\_

h) 259999.2

\_\_\_\_\_

**5.** Complete each calculation below. Write your answer with the correct number of significant figures. After you completed your calculation write the number of sig figs of the answer.

Answer

Sig Figs

A) Multiply 2.4 by 3.77

\_\_\_\_\_

B) Multiply  $1.7 \times 10^5$  by  $3.77 \times 10^{-5}$

\_\_\_\_\_

C) Divide  $2.500 \times 10^3$  by  $5.000 \times 10^3$

\_\_\_\_\_

D) Add 205.36 and 157 and 72.5

\_\_\_\_\_

E) Subtract 11.9986 from 12.0097

\_\_\_\_\_

F) Add 0.0002736 to 0.940

\_\_\_\_\_

G) 
$$\frac{(2.53 \times 10^4) \cdot (7,500)}{6.325 \times 10^7}$$

\_\_\_\_\_

G) 
$$\frac{(.08297) \cdot (4.50 \times 10^{-4})}{5.9287 \times 10^7}$$

\_\_\_\_\_

**6.** Convert the following numbers from the units in the left column to the units in the right column. **Use dimensional analysis.** You must show all conversion factors used to calculate your answer (some conversions may require more than one conversion factor). Your answer must have the correct number of significant figures.

Note: 2.54 cm = exactly 1 in (this is a measurement in cm, not a definition).

(a) 243 mg \_\_\_\_\_ g

(b) 0.0752 km \_\_\_\_\_ m

(c) 20.0 mL \_\_\_\_\_ L

(d)  $2.07 \times 10^5$  cm \_\_\_\_\_ km

(e) 52.5 in \_\_\_\_\_ m