Significant Figures

Name: _____

Student ID: _____

Date: _____

"It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so." — Mark Twain

1. The four rules of significant figures are…

  (fill in the blank with either "<u>significant</u>" or "<u>not significant</u>")

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) 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 $\frac{miles}{hr}$ _____   r) 12 $\frac{inches}{foot}$ _____

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 $\frac{miles}{hr}$

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 1.7×10^5 by 3.77×10^{-5}

_____   _____

C) Divide 2.500×10^3 by 5.000×10^3

_____   _____

D) Add 205.36 and 157 and 72.5

_____   _____

E) Subtract 11.9986 from 12.0097

_____   _____

F) Add 0.0002736 to 0.940

_____   _____

G) $\dfrac{\left(2.53 \times 10^4\right) \bullet \left(7{,}500\right)}{6.325 \times 10^7}$

_____   _____

H) $\dfrac{\left(.08297\right) \bullet \left(4.50 \times 10^{-4}\right)}{5.9287 \times 10^7}$

_____   _____

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

(a) 243 mg   _____   g

(b) 0.0752 km   _____   m

(c) 20.0 mL   _____   L

(d) 2.07 x 10^5 cm   _____   km

(e) 52.5 in   _____   m