

## Math Review & Problem Solving 2

1. Carry out the following conversions by ***DIMENSIONAL ANALYSIS***. Express the answers to the correct number of significant figures. (*Use the back cover of the book and your notes for some conversion factors.*)

A)  $5.202 \times 10^6 \mu\text{m} \rightarrow \text{in}$

G)  $45,000 \text{ pm} \rightarrow \mu\text{m}$

B)  $0.00233 \text{ dm}^3 \rightarrow \text{cm}^3$

H)  $9.55 \times 10^7 \text{ Hz} \rightarrow \text{MHz}$

C)  $500. \text{ ng} \rightarrow \text{mg}$

I)  $0.221 \text{ mL} \rightarrow \text{fl. oz.}$

D)  $750 \text{ kHz} \rightarrow \text{Hz}$

J)  $5.52 \text{ gal} \rightarrow \text{mL}$

E)  $3.25 \times 10^{12} \text{ dm}^3 \rightarrow \text{km}^3$

K)  $6000 \text{ revolutions/min} \rightarrow$   
 $\text{revolutions/hour}$

F)  $75 \text{ mi/hr} \rightarrow \text{m/s}$

L)  $18.7 \text{ g/cm}^3 \rightarrow \text{oz/in}^3$

2. Express the following numbers in proper scientific notation.

A) 555,000,000

F) 15.120

B) 0.0008600

G)  $0.000785 \times 10^{-5}$

C)  $378.4 \times 10^{15}$

H) 3250

D) 0.00987

I) 23,000,000,000

E) 34.5

J)  $4^{12}$

3. Simplify the following expressions to single powers of 10 (without a calculator!):

A)  $\frac{10^{-8} \cdot 10^3}{10^{-12}} =$

B)  $\frac{10^4 \cdot 10^{12}}{10^7 \cdot 10^{-1}} =$

C)  $\frac{(10^4)^2}{10^5} =$

4. A chemistry teacher has a height of 70.0 inches. What is the height of that teacher in meters?

5. What is the mass of a gold bar (in kilograms) with a weight of 100. oz. ?

6. What is the density of a piece of wood if it has a mass of  $1.55 \times 10^6$  g and a volume  $1.74 \text{ m}^3$ ?
7. What is the volume of a piece of lead that is 73.7 kg? ( $D_{\text{lead}} = 11.4 \text{ g/cm}^3$ )
8. What mass of gasoline are you putting in your car if fill up with 45 L? ( $D_{\text{gasoline}} = 0.671 \text{ g/mL}$ )
9. How many significant figures are in each of the following numbers?
- |                            |              |
|----------------------------|--------------|
| A) 1.00100                 | E) 450,000.  |
| B) 0.00023                 | F) 95,000    |
| C) $1.2500 \times 10^{-7}$ | G) 0.0090090 |
| D) 320,000                 | H) 5 cars    |

10. Express the answers to the following problems in scientific notation with the correct number of sig figs:

A.  $3.25 \times 10^5 \times 1.79 \times 10^{-20}$

F.  $4.55 \times 10^{25} + 3.22 \times 10^{26}$

B.  $45.83 + 7.170$

G.  $300. \times 500.$

C.  $40.00 \times 12.591$

H.  $40 \times 12.591$

D.  $320,000 \times 8.51$

I.  $1200 + 32,000$

E.  $0.00359 - 0.0000912$

J.  $\frac{325 - 65}{42.48}$