

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) $6000 \text{ revolutions/min} \rightarrow$
 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) 0.000785×10^{-5}

C) 378.4×10^{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 1.55×10^6 g and a volume 1.74 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) 1.2500×10^{-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. 40.00×12.591

H. 40×12.591

D. $320,000 \times 8.51$

I. $1200 + 32,000$

E. $0.00359 - 0.0000912$

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