

Chapter 1

Physics Review for Final Exam

Answers

4d)  $5.6 \times 10^{-4} \text{ mg} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}}$

$= 5.6 \times 10^{-10} \text{ kg}$

\* corrected  
Jan 26

4e)  $6.2 \text{ hours} \times \frac{3600 \text{ s}}{1 \text{ hours}}$

$= 22320 \text{ s}$   
or  $2.232 \times 10^4 \text{ s}$

1) +/- sig fig rules → least # of decimal points

a) 
$$\begin{array}{r} 12.678 \text{ mm} \\ + 0.25 \text{ mm}^* \\ \hline 12.928 \end{array} \rightarrow \boxed{12.93 \text{ mm}}$$

b) 
$$\begin{array}{r} 12.345 \text{ mL} \\ - 0.34 \text{ mL}^* \\ \hline 12.005 \end{array} \rightarrow \boxed{12.00 \text{ mL}}$$

c) 
$$\begin{array}{r} 1.0001 \text{ mm} \\ - 0.1 \text{ mm}^* \\ \hline 0.9001 \text{ mm} \end{array} \rightarrow \boxed{0.9 \text{ mm}}$$

d) 
$$\begin{array}{r} 12.5 \text{ g}^* \\ + 0.0005 \text{ g} \\ \hline 12.5005 \end{array} \rightarrow \boxed{12.5 \text{ g}}$$

2)  $\times / \div$  sig fig rules  $\rightarrow$  least # of sig figs

a)  $1.25 \text{ mm}$  3 SF  
 $\times 0.25 \text{ mm}$  2 SF \*

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 $0.3125 \rightarrow \boxed{0.31 \text{ mm}}$

b)  $3.987654 \text{ cm}$  7 SF  
 $\times 1.3 \text{ cm}$  2 SF \*

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 $5.1839502 \rightarrow \boxed{5.2 \text{ cm}}$

c)  $14.0 \text{ cm}^2$  /  $2.1 \text{ cm}^2$   $\frac{3 \text{ SF}}{2 \text{ SF}} *$

$$= 6.66\bar{6} \rightarrow \boxed{6.7 \text{ cm}^2}$$

d)  $98.45 \frac{\text{g}}{\text{mL}} \times 5.762 \text{ mL}$   $\frac{4 \text{ SF} \cdot 4 \text{ SF}}{2 \text{ SF}} *$

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 $1.4 \text{ g}$ 

$$= 405.192 \rightarrow \boxed{4.0 \times 10^2}$$

rule 1: 5's round  $\neq \uparrow$  (up) if it is odd, nothing if even

rule 2: 400 written w/ 2 sig figs must be written in scientific notation

### 3) Scientific Notation

move decimal to + right:  $\ominus$  exponent

$$0.0042 \rightarrow 4.2 \times 10^{-3}$$

move decimal to  $\neq$  left:  $\oplus$  exponent

$$6748026 \rightarrow 6.748026 \times 10^3$$

a)  $0.00572 \text{ kg} \rightarrow \boxed{5.72 \times 10^{-3} \text{ kg}}$

b)  $520000000000 \text{ km} \rightarrow \boxed{5.2 \times 10^{11} \text{ km}}$

c)  $118.70004 \text{ g} \rightarrow \boxed{1.1870004 \times 10^2 \text{ g}}$

d)  $0.00000000000000000016 \text{ cm}$   
 $\rightarrow \boxed{1.6 \times 10^{-19} \text{ cm}}$

### 4) converting units have $\times$ want have

a)  $16 \cancel{\text{g}} \times \frac{1 \text{ ks}}{1000 \cancel{\text{g}}} = \boxed{0.016 \text{ ks}}$

b)  $75000 \text{ mL} \times \frac{1 \text{ L}}{1000 \text{ mL}} = \boxed{75 \text{ L}}$

c)  $457 \text{ km} \times \frac{10^6 \text{ mm}}{1 \text{ km}} = \boxed{4.57 \times 10^8 \text{ mm}}$