Chapter 1 Exam Review

Physics Honors Name: _____ Period: _____

DIMENSIONAL ANALYSIS PROBLEMS

Conversions Factors			
1 hr = 60 min	1 min = 60 sec	1 ton = 2000 lbs	7 days = 1 week
24 hrs = 1 day	1 kg = 2.2 lbs	1 gal = 3.79 L	264.2 gal = 1 cubic meter
1 mi = 5,280 ft	1 kg = 1000 g	1 lb = 16 oz	20 drops = 1 mL
365 days = 1 yr	52 weeks = 1 yr	2.54 cm = 1 in	1 L = 1000 mL
0.621 mi = 1.00 km	1 yd = 36 inches	1 cc is 1 cm^3	1 mL = 1 cm^3

DIRECTIONS: Solve each problem using dimensional analysis. Every number must have a unit. Work must be shown. Conversion factors are given above.

1.) How many miles will a person run during a 10 kilometer race?

2.) The average American student is in class 330 minutes/day. How many hours/day is this?

How many seconds is this?

3) Chicago uses 1.2 x 10^9 gallons of water /day. How many gallons per second must be pumped from the lake every second to supply the city?

4) Sixty miles/ hour is how many ft/sec?

5) Lake Michigan holds 1.3 x 10^{15} gallons of water. If just Chicago removed water from the lake and it never rained again, how many days would the water last? Chicago uses 1.2 x 10^9 gallons of water /day

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6). If a person weighs 125 lbs, 8 oz., how many mg does s/he weigh?

7). A gas station is charging $1.299 per gallon of gas. What would be the price for a liter of gas?

8). Determine the number of years in 8.35×10^6 minutes.

Dimensional Analysis Word Problems

You must use the formal method of dimensional analysis as taught in this class in order to get credit for these solutions.

1. Every three times I clean my bedroom, my mother makes me an apple pie. I cleaned my bedroom 9 times. How many apple pies does she owe me? (What? Your mother doesn't reward you for cleaning your bedroom? Aren't there child labor laws? To make up for that injustice, you may have this very easy problem.)

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2. A Wilton High School senior was applying to college and wondered how many applications she needed to send. Her counselor explained that with the excellent grade she received in chemistry she would probably be accepted to one school out of every three to which she applied. [*3 applications = 1 acceptance*] She immediately realized that for each application she would have to write 3 essays, [*1 application = 3 essays*] and each essay would require 2 hours work *[1 essay = 2 hours*]. Of course writing essays is no simple matter. For each hour of serious essay writing, she would need to expend 500 calories [*1 hour = 500 calories*] which she could derive from her mother's apple pies [1 pie = 1000 calories]. How many times would she have to clean her room in order to gain acceptance to 10 colleges? Hopefully you didn't skip problem No 1. I'll help you get started.... 10 acceptances [ ] [ ] etc.

3. Because you never learned dimensional analysis, you have been working at a fast food restaurant for the past 35 years wrapping hamburgers. Each hour you wrap 184 hamburgers. You work 8 hours per day. you work 5 days a week. you get paid every 2 weeks with a salary of $840.34. How many hamburgers will you have to wrap to make your first one million dollars? [You are in a closed loop again. If you can solve the problem, you will have learned dimensional analysis and you can get a better job. But, since you won't be working there any longer, your solution will be wrong. If you can't solve the problem, you can continue working which means the problem is solvable, but you can't solve it. We have decided to overlook this impasse and allow you to solve the problem as if you had continued to wrap hamburgers.]

Significant Figures Worksheet

1. Indicate how many significant figures there are in each of the following measured values.

246.32	_____	1.008	_____	700000	_____
107.854	_____	0.00340	_____	350.670	_____
100.3	_____	14.600	_____	1.0000	_____
0.678	_____	0.0001	_____	320001	_____

2. Calculate the answers to the appropriate number of significant figures.

32.567	246.24	658.0
135.0	238.278	23.5478
+ 1.4567	+ 98.3__	+ 1345.29__

3. Calculate the answers to the appropriate number of significant figures.

a) 23.7 x 3.8	=	_____	e) 43.678 x 64.1	=	_____
b) 45.76 x 0.25	=	_____	f) 1.678 / 0.42	=	_____
c) 81.04 x 0.010	=	_____	g) 28.367 / 3.74	=	_____
d) 6.47 x 64.5	=	_____	h) 4278 / 1.006	=	_____