



# **Weekly Homework Sheet-** **Physics2 MS2/HS1** **Waves Light & Modern Physics** Week of (8/30/11)

*The goal of the first week homework is to get students back up to speed with where we left off last year. It may take a little while, but the goal is to use this homework to get the basics down so we can focus on problem solving, more labs and practice this year.*

1. **Due Thursday (MS2) (9/1/11) Computer Work- PSAT & SAT subject test exploration on College board .com, Print out what was done on Khan Academy this summer.**
2. **Due Friday (9/2/11) Due Equation Practice Review #1, Grand Prize Game Lab Preliminary Work ( Handed out separately)**
3. **Due Monday(9/5/11) Review Sheet #2**

Name: \_\_\_\_\_ Grade: \_\_\_\_\_ Date: \_\_\_\_\_

## PCA/CFA Equation Review\*\* #1

Due Fri

\* Problems are Bonus....,

\*\*If you are new, I want to see as much done as possible within an hour's worth of time. Please use any resources you like, but the internet, classmates, books are all fair game.

For HS1. Also Explore College Board.com for PSAT and SAT Subject test, sample questions.

Mastery Standards:

I. Quantity & Measurement:

a. Knows Basic units

Give the (MKS- Metric) Unit for:

1. Power: \_\_\_\_\_
2. Friction Force: \_\_\_\_\_
3. Work: \_\_\_\_\_
4. Acceleration: \_\_\_\_\_
5. Weight: \_\_\_\_\_
6. Mass: \_\_\_\_\_
7. Coefficient of Friction: \_\_\_\_\_
8. Normal Force: \_\_\_\_\_
9. Displacement: \_\_\_\_\_
10. Resistance: \_\_\_\_\_

b. Knows Basic Equations

1. Gravitational Potential Energy: \_\_\_\_\_

2. Spring Potential Energy: \_\_\_\_\_

3. Frictional Force: \_\_\_\_\_

4. Einstein's relationship between mass and Energy: \_\_\_\_\_

5. Wavelength, frequency, speed of a wave: \_\_\_\_\_

6. Kinetic Energy: \_\_\_\_\_

7. Density: \_\_\_\_\_

8. Work ( In general): \_\_\_\_\_ = \_\_\_\_\_ with angle

9. Power (In general- not electric): \_\_\_\_\_

10. Weight: \_\_\_\_\_

### c. Knows Less Basic Equations

1. Universal Gravitation Force: \_\_\_\_\_
2. Gravitation potential: \_\_\_\_\_
3. Impulse: \_\_\_\_\_
4. Hooke's law: \_\_\_\_\_
5. Energy of a frequency of Light: \_\_\_\_\_
6. \*Period of a pendulum: \_\_\_\_\_
7. \*Period of a mass on a spring: \_\_\_\_\_
8. \*Torque: \_\_\_\_\_ = \_\_\_\_\_ with angle...
9.  $D_{\text{final}}$ : \_\_\_\_\_
10. \*Angular Momentum: \_\_\_\_\_
11. Centripetal Force: \_\_\_\_\_ and  
Acceleration: \_\_\_\_\_
12. Charles' Law: \_\_\_\_\_
13. Boyle's Law: \_\_\_\_\_
14. Universal Gas Law: \_\_\_\_\_ T uses which  
temp scale? \_\_\_\_\_
15. Efficiency of a heat engine (Use Q): \_\_\_\_\_
16. The relationship between heat and change in  
Temp. = \_\_\_\_\_
17. \*1<sup>st</sup> Law of Thermo:  
Change in Potential  $\Delta$  \_\_\_\_\_ =  $\Delta$  \_\_\_\_\_ +  $\Delta$  \_\_\_\_\_
18. Doppler effect (own words): \_\_\_\_\_
19. Capacitance = \_\_\_\_\_
20. Ohm's law = \_\_\_\_\_
21. Magnification = \_\_\_\_\_

## Constants:

22. Speed of Light = \_\_\_\_\_  
23. Speed of sound = \_\_\_\_\_  
24. Accel of gravity near surface of earth = \_\_\_\_\_

### d. Vectors & Definitions

1. What is the area under the Acceleration vs Time Graph: \_\_\_\_\_
2. What are possible values of the sum of a vector 4m long and 3m long?  
a. 0m   b. 8 m   c. 1.2 m   d. 7.1 m
3. Domain is all of the possible: \_\_\_\_\_ values of a function
4. The slope of the displacement vs time graph is \_\_\_\_\_
5. The Normal Force = \_\_\_\_\_
6. Draw the force Diagram for:
  - a. 2 protons



- b. 2 electrons

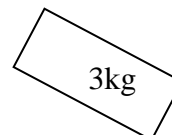
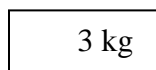


- c. An electron and a proton



## II. Problem Solving & Graphing:

- a. Knows how to draw & set up Basic FBD
1. Draw the FBD of a 3 kg box (Below) being held up by one string ( label all forces with values)



2. Draw the FBD of a 3 kg box (Above) on an inclined plane at a  $37^\circ$  angle. ( label all forces, values are bonus)

Basic Derivatives:      Level: \_\_\_\_\_ ( These are for teacher use only)

1.  $D = 2t^{25}$

a.  $V = \underline{\hspace{2cm}}$

b.  $A = \underline{\hspace{2cm}}$

2.  $V = 50t^{11}$

a.  $A = \underline{\hspace{2cm}}$

b.  $D = \underline{\hspace{2cm}}$       (be careful)

3.  $A = 10$

a.  $V = \underline{\hspace{2cm}}$

b.  $D = \underline{\hspace{2cm}}$

Name: \_\_\_\_\_ Grade: \_\_\_\_\_ Date: \_\_\_\_\_

## PCA/CFA Physics 2 Review #2

Due Monday Sept 5.

\* Problems are Bonus...

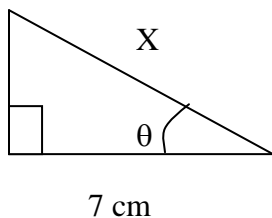
Lines, Slopes, Slope intercept form: Level: \_\_\_\_\_

1.  $Y = -7X - 3$  Slope = \_\_\_\_\_, Y intercept = \_\_\_\_\_
2.  $Y = 4X + \pi$  Slope = \_\_\_\_\_, Y intercept = \_\_\_\_\_
3. Find the slope between these 2 points (3, 7) and (0,0) \_\_\_\_\_
4. Find the slope between these 2 points (6, 2) and (4,6) \_\_\_\_\_
5. What is the definition of slope? \_\_\_\_\_

Basic Trigonometry: Level: \_\_\_\_\_

1. An important word for Trig that helps us know the functions: \_\_\_\_\_

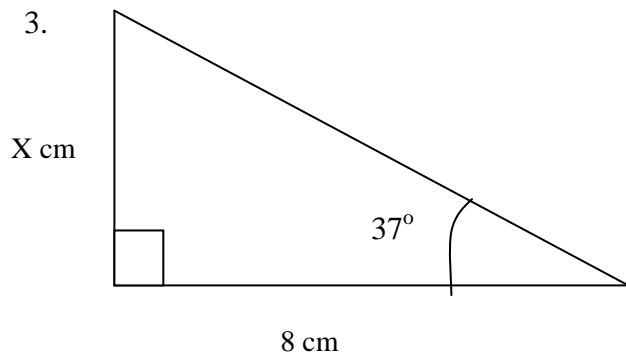
2.



What trig function would you use to solve for X?

**Cos  $\theta$  Sin  $\theta$  Tan  $\theta$**   
(Circle one)

3.



a. Label given sides

b. Which trig function do you use?

c. Solve for X.

## Graphing Physics Level \_\_\_\_\_

Miscellaneous topics: Level \_\_\_\_\_

1. 15 % of 8050 is ? \_\_\_\_\_
2. What is the difference between Mass and weight? \_\_\_\_\_
3.  $*y = 9x^8$  is even, odd or neither? (circle one)
4. a.  $7^{10} * 7^5 = 7^{---}$   
b.  $(7^{10})^5 = 7^{---}$   
c.  $\frac{7^9}{7^{15}} = 7^{---}$
6. Simplify  $y = 9x^9 + 2x^5 - 4x^5*x^4 - 3x^5 =$   
\_\_\_\_\_
7.  $*165 = 10t^2 + 5$  Solve for t

Fill in the Chart

<b>Temp</b>	<b>Kelvin</b>	<b>Fahrenheit</b>	<b>Celsius</b>
<i>Who uses it</i>	<i>Scientists</i>	<i>In USA</i>	<i>Everywhere else</i>
<b>Abs. Zero</b>			
<b>Water Freezes</b>			
<b>Room Temp</b>			
<b>Body Temp</b>			
<b>Water Boils</b>			

<p>11) Charles law =</p> <p>If the pressure remains constant, the initial volume of a gas is 20 liters, and the initial temperature is 100K, if the temperature is raised to 500K what would the new volume be?</p>	<p>12) The eff. Of a heat engine is:</p> <p>It Flo's Car's engine has a cool cycle of 100K and a hot cycle of 300K, what is the maximum efficiency of the engine?</p>	<p>13) Heat of <b><u>Vaporization</u></b> means: _____</p>
<p>14) Extra ordinaries/Bonus:  <math>D = -3 \sin(3t^{-4})</math>  <math>V =</math> _____  <math>A =</math> _____</p>	<p>15) Linear expansion helps explain that as something gets hotter it tends to _____</p>	<p>17) <math>f(x) = 3x + 1</math>;  <math>g(x) = f(x) + 2</math>  <math>h(x) = f(x) - 2(g(x))</math></p> <p><math>f(1) =</math> _____  <math>g(1) =</math> _____  <math>h(1) =</math> _____  <math>f(g(3)) =</math> _____          Bonus: <math>f(g(h(f(2)))) =</math> _____</p> <p><b><u>Composite (imbedded) functions</u></b></p>