

**HONORS PHYSICS and PHYSICS  
SUMMER ASSIGNMENT  
2015**

**NAME:**

This summer assignment includes a basic review of the mathematics you will need to be successful in this class. Physics the study of matter and energy. We will begin our study with kinematics (motion). Once we talk about motion, we will discuss why things move. This will lead us to discussing about collisions, energy, waves, light, electricity, and magnetism. Physics explains the physical world around us. In order to fully understand physics we will need to apply math. This packet includes review of algebra and trigonometry (sine, cosine, tangent).

**It is VERY important that this assignment is to be completed by you.** Copying someone's answers is not acceptable; asking for help is acceptable. If you have forgotten how to do something, then use your resources (HINT: teachers, the internet, friends, etc.) **Colleges want students who can find their own information and so do employers.**

Physics will teach you all how to problem solve, critically think, and apply the mathematics that seems to make no sense. If you have any questions as you work through these problems, feel free to email me at [adam.alster@detroitk12.org](mailto:adam.alster@detroitk12.org).

As you work through these problems, be sure to show all work on a separate sheet of paper. Write the final answer in the space provided. You will staple the work to this sheet when you turn it in.

The second part to this summer assignment is to complete the student survey found at the following website, [click here](#). This survey will help me better teach you all as a class by giving me more information about all of you.

**THIS ASSIGNMENT IS DUE THE FIRST FRIDAY OF SCHOOL, SEPTEMBER 11, 2015.**

**PART I: USING AND REINFORCING MATH IN PHYSICS**

Throughout the year, you will be applying your math skills as you learn the concepts of physics. You will find that these skills will become much stronger and your problem solving abilities will also be strengthened as you see that mathematics is a method of modeling, interpreting and predicting actual physical phenomenon.

1. Please determine: how many significant figures do the following numbers below have? Pay attention to the rules of when a zero is a significant figure.

a. 1203.4 kg \_\_\_\_\_

b. 0.0203 g \_\_\_\_\_

c. 8900 s \_\_\_\_\_

d. 9101.0 mg \_\_\_\_\_

e. 9010 km \_\_\_\_\_

f. 10900.010 N \_\_\_\_\_

g. 0.00120 ns \_\_\_\_\_

h.  $3.4 \times 10^4$  n \_\_\_\_\_

i.  $9.10 \times 10^{-3}$  J \_\_\_\_\_

j.  $9.010 \times 10^{-3}$  W \_\_\_\_\_

k. 0.0030 g \_\_\_\_\_

l. 102001.0 mg \_\_\_\_\_

m. 780. km \_\_\_\_\_

n. 1000 ms \_\_\_\_\_

o. 918.010 g \_\_\_\_\_

p. 0.0001 s \_\_\_\_\_

q. 0.00390 g \_\_\_\_\_

r. 8120km \_\_\_\_\_

s.  $7.991 \times 10^{-10}$  m \_\_\_\_\_

t. 72 °C \_\_\_\_\_

2. Determine how many decimal places the solution will have. DO NOT SOLVE.

\_\_\_\_\_  $95.32 \text{ km} + 102.5 \text{ km} + 77$

\_\_\_\_\_  $11.840 \text{ L} - 5.0 \text{ L}$

\_\_\_\_\_  $0.005070 \text{ cm} + 6.900 \text{ cm} + 2000.860$   
 \_\_\_\_\_  $1275 / 120 \text{ L}$   
 \_\_\_\_\_  $(450.1 \text{ m}) (1.040 \times 10^{-2} \text{ m}) (6.00 \text{ m})$

\_\_\_\_\_  $(121.20 \text{ cm}) (23 \text{ cm})$   
 \_\_\_\_\_  $1070 \text{ m} / 10.920 \text{ m}$   
 \_\_\_\_\_  $(518 \text{ cm}) (21.3 \text{ cm})$

3. Convert the following:

- a.  $1.5 \text{ cm} \rightarrow \text{m}$  \_\_\_\_\_
- b.  $6.9 \text{ km} \rightarrow \text{m}$  \_\_\_\_\_
- c.  $800 \text{ mm} \rightarrow \text{m}$  \_\_\_\_\_
- d.  $7560.3 \text{ g} \rightarrow \text{kg}$  \_\_\_\_\_
- e.  $72 \text{ minutes} \rightarrow \text{seconds}$  \_\_\_\_\_
- f.  $1.4 \text{ hours} \rightarrow \text{seconds}$  \_\_\_\_\_

- g.  $2.0 \text{ miles} \rightarrow \text{ft}$  \_\_\_\_\_
- h.  $4.32 \text{ ft} \rightarrow \text{inches}$  \_\_\_\_\_
- i.  $2.4 \text{ inches} \rightarrow \text{cm}$  \_\_\_\_\_
- j.  $0.1 \text{ miles} \rightarrow \text{m}$  \_\_\_\_\_
- k.  $27 \text{ miles / hour} \rightarrow \text{meters / second}$  \_\_\_\_\_

4. Solve the following equations for the unknown.

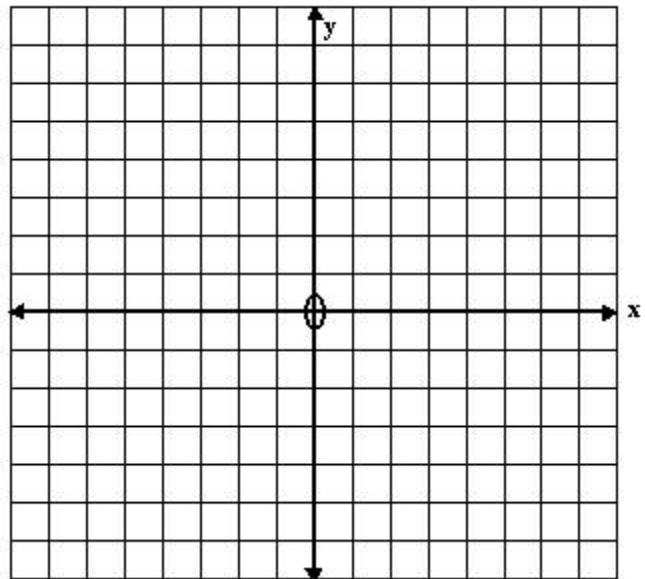
- a.  $37 - x = 98$  \_\_\_\_\_
- b.  $-55 = x^2 + 32$  \_\_\_\_\_
- c.  $-31t^2 = -93$  \_\_\_\_\_
- d.  $18x - 12x = -96$  \_\_\_\_\_

- e.  $9r + 3r - 5 = 25$  \_\_\_\_\_
- f.  $6x + 5x - 4 = 2x - 8$  \_\_\_\_\_
- g.  $(x/4) = -45$  \_\_\_\_\_
- h.  $x^2 - 4 = 3$  \_\_\_\_\_

5. Graphing

a. Use the following data to create a graph on the plot to the right.

t (s)	d (m)
0	-3
1	-1
2	1
3	3
4	5
5	7



- b. Using your graph, draw the line of best fit.
- c. Using two points on your line, determine the equation that best fits the line of best fit.

d. What type of relationship (direct or indirect) is shown in the graph? How do you know?

6. Label the right triangle shown below with the terms; hypotenuse, opposite and adjacent as identified from angle  $\theta$ , (theta). Write the ratios for sin, cos and tan.

	<p>sin = _____</p> <p>cos = _____</p> <p>tan = _____</p>
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