

Hi All,

Welcome to Physics! This worksheet is the summer assignment for students taking Physics with Mr. Lin in 2019-20 academic year. The worksheet will help you review a few topics in high school Math since Math is the language of Physics. You are encouraged to go deeper in each topic by finding online resources. You are also welcome to email Mr. Lin at [clin@erhsnyc.net](mailto:clin@erhsnyc.net) if you encounter any problems.

*Have a Great Summer!*

Mr. Lin

1. Scientific Notation:

- a.  $125,000 =$  \_\_\_\_\_
- b.  $0.00125 =$  \_\_\_\_\_
- c.  $1.9 \times 10^2 =$  \_\_\_\_\_
- d.  $2.4 \times 10^4 =$  \_\_\_\_\_
- e.  $(5.0 \times 10^5) (2.5 \times 10^4) =$  \_\_\_\_\_

2. Significant Figures:

- a. No. of significant figures of 125400 = \_\_\_\_\_
- b. No. of significant figures of 1001 = \_\_\_\_\_
- c. No. of significant figures of 12300. = \_\_\_\_\_
- d. No. of significant figures of 1254.00 = \_\_\_\_\_
- e. No. of significant figures of 0.001250 = \_\_\_\_\_
- f.  $(1.234 \times 10^5) + (2.4 \times 10^4) =$  \_\_\_\_\_
- g.  $(1.234 \times 10^5) \times (2.4 \times 10^4) =$  \_\_\_\_\_

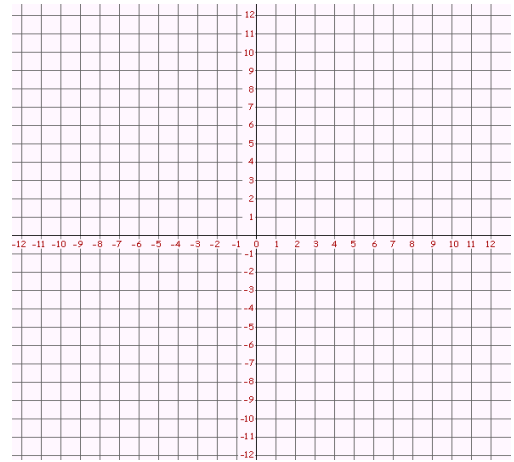
3. Precision & Accuracy:

- a. Accepted value: 100  
Measured value: 75  
Percent error = \_\_\_\_\_
- b. Accepted value: 75  
Measured value: 100  
Percent error = \_\_\_\_\_

4. Graphing:

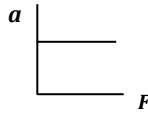
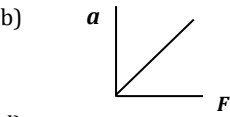
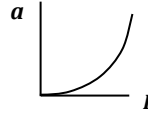
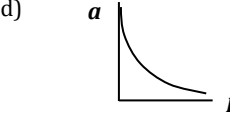
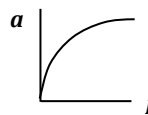
- a. Graph the axes,
- b. Graph the data points on the grid, and
- c. Draw the line of best fit.
- d. Calculate the slope of the line.

Time (s)	Distance (m)
0.0	0.
1.0	1.8
2.0	3.9
4.0	8.1
5.0	10.4

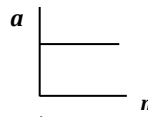
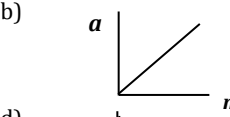
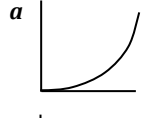
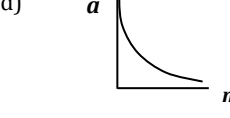
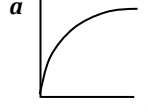


5. Mathematical Analysis:

a. If  $F = ma$  describes the relationship between the force ( $F$ ) and acceleration ( $a$ ) with constant mass ( $m$ ), which of the following graphs represents this relationship?

- a) 
- b) 
- c) 
- d) 
- e) 

b. If  $F = ma$  describes the relationship between the mass ( $m$ ) and acceleration ( $a$ ) with constant force ( $F$ ), which of the following graphs represents this relationship?

- a) 
- b) 
- c) 
- d) 
- e) 

c. If  $KE = \frac{1}{2} mv^2$  describes the relationship between the kinetic energy ( $KE$ ) and velocity ( $v$ ) with constant mass ( $m$ ), sketch the graph representing this relationship?

d. If  $F_e = kq_1q_2/d^2$  describes the relationship between the electric force ( $F_e$ ) and distance ( $d$ ), sketch the graph representing this relationship?

6. Solving Equation:

a. If  $mv = ft$ , solve for  $t$ .

b. If  $d = \frac{1}{2}gt^2$ , solve for  $t$ .

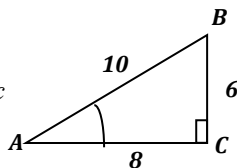
c. If  $F_g = G \frac{m_1m_2}{d^2}$ , solve for  $d$ .

d. If  $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$ , solve for  $R$

e. If  $\begin{cases} \frac{1}{2}x + \frac{\sqrt{3}}{2}y = 1 \\ \frac{\sqrt{3}}{2}x - \frac{1}{2}y = 0 \end{cases}$ , solve for  $x$  and  $y$

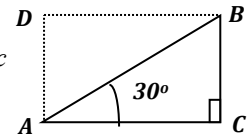
7. Trigonometry:

a. Calculate the trigonometric ratios.



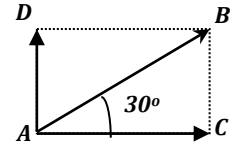
- a)  $\sin A =$                       d)  $\sin B =$
- b)  $\cos A =$                       e)  $\cos B =$
- c)  $\tan A =$                       f)  $\tan B =$

b. Calculate the trigonometric ratios.



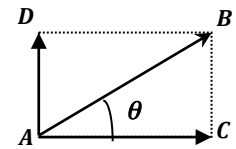
- a)  $\sin A =$                       d)  $\sin B =$
- b)  $\cos A =$                       e)  $\cos B =$
- c)  $\tan A =$                       f)  $\tan B =$

c. Represent the magnitude of the following vectors in terms of  $AB$ .



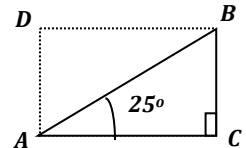
- a)  $AC =$
- b)  $AD =$

d. Represent the magnitude of the following vectors in terms of  $AB$  and  $\theta$ .



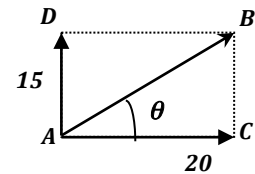
- a)  $AC =$
- b)  $AD =$

e. If  $AB = 20$ , and  $\angle A = 25^\circ$ , calculate:



- a)  $AC =$
- b)  $AD =$

f. Calculate the angle  $\theta$



- a)  $\theta =$

g. Double Angle Formula

- a)  $\sin 2x =$  \_\_\_\_\_
- b)  $\cos 2x =$  \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_