Name _____ Hour _____

Learning Targets for the Mathematics Needed for Physics

EQUATIONS are always given to you. The first unit uses these ones:

$m = \frac{y_2 - y_1}{x_2 - x_1}$ **$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}}$** **$\cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}}$** **$\tan\theta = \frac{\text{opposite}}{\text{adjacent}}$** **$a^2 + b^2 = c^2$**

☐ **TARGET #1- I UNDERSTAND AND CAN USE SCIENTIFIC NOTATION.**

Put the following numbers in scientific notation.

1. 7,542 _____
2. 0.00800 _____
3. 100,000 _____

Expand the following numbers.

4. 7.4×10^{-3} _____
5. 1.0248×10^{-2} _____
6. 6.123×10^{3} _____

☐ **TARGET #2- UNDERSTANDING THE METRIC SYSTEM AND CONVERSIONS**

Conversions you will need to have memorized by the first physics quiz.

LENGTH

1 km = _____ m
1 m = _____ cm
1 inch = _____ cm
1 mile = _____ m
1 mile = _____ km

MASS

1 kg = _____ g
1 kg = _____ lbs.

VOLUME

1 L = _____ mL

TIME

1 hour = _____ sec

Perform the following conversions. Please show your work…even if you don't need to!

7. 10,200 m = _____ miles

8. 4.21×10^{-3} m = _____ cm

9. 46 kg = _____ lbs

10. 23 cm = _____ ft

11. 40.1 miles = _____ km

12. 43.0 feet = _____meters (1 in=2.54 cm) (**This has multiple steps…there are not 3 ft in a m**)

☐ **TARGET #3- I CAN SOLVE FOR X AND FIND UNITS USING ALGEBRA.**

Solve the following equations for x.

13. $4x + 3 = 7$

14. $\frac{2x}{5} = \frac{3}{7}$

15. $\frac{5x}{3} = 20$

16. $\frac{1}{2} + \frac{1}{4} = \frac{1}{x}$

Name _____ Hour _____

ALGEBRA OF UNITS:

17. In one physics equation we will **multiply** acceleration (meters/sec^2) by time (sec). If you MULTIPLY those units, what unit will you end up with? (units work just like numbers…they can cancel)

18. In another physics equation we will **divide** velocity (m/sec) by time (sec). If you DIVIDE those units, what unit will you end up with?

19. 20 meters/sec = $\frac{\text{x}}{5 \text{ sec.}}$ **The answer to #19 is* _____ and the units are _____

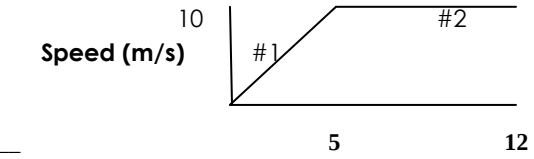
☐ **TARGET #4 -I UNDERSTAND HOW TO USE AND READ A GRAPH.**

20. What does it mean when two variables are:

a. related directly?_____

b. related indirectly or inversely? _____

21. Use the graph to answer the following questions:



a. What is the slope of line #1? _____

b. After 6 sec, how fast are you traveling? _____

c. Are you moving faster at 3 sec or 7 sec? _____

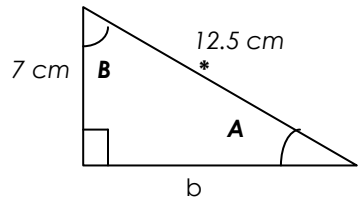
d. Find the area under the graph. _____
(Do this by breaking it into shapes: a triangle and a rectangle work great), find the area of each shape (1/2 B x H and L x W), and then add them together)

The total area under the graph= _____

☐ **TARGET #5- I UNDERSTAND BASIC TRIGONOMETRY.**

******Make sure your calculator is in <u>degree mode</u> in physics!***

22. Use the triangle below to answer the questions.



a. Find the length of side b. _____

b. Find angle A in degrees. _____

c. Use the equation to solve for B in degrees: $\frac{\text{Sin } 34.06^\circ}{7} = \frac{\text{Sin B}}{10.4}$