



Weekly Sheet for M\$1/H\$1a STEM/PHYSICS

Michael Dixon (MD²)

mdixon@parksideca.org

Week #6, Week of Mon(10/3) to Tues(10/11)



Topics/Content/Skills: Vectors/ How things Move/Measuring velocity

Skills:

- Identify and calculate the components of a vector.
- Identify a velocity and Acceleration graph from a Displacement vs Time graph.
- Solve 1 and 2 step algebra problems for trig.
- Can convert to and from Scientific notation.
- Can convert between 1 level of units. (ex. from cm to Meters)
- Understand What Kinematics means, and knows the basic equations of kinematics.
- Understands that Projectile motion has 2 types of motion going on.

Vocabulary/Key Terms/Formulas:

Vectors, components,

Homework/Classwork: (All homework is due the next class day unless indicated.)

	<u>In Class</u>	<u>Homework Due in this Class</u>
<u>Monday</u> <u>9/26</u>	<u>Finish 1d Newton's Laws</u> Khan Academy Sci notation Practice	HM Mastery Sheet #12
<u>Tuesday</u>	<u>Component of vectors</u>	HM Mastery Sheet #13
<u>Wednesday</u>	<u>Review for Quiz #3</u> <u>If time Vector lab</u>	HM Mastery Sheet #14
<u>Thursday</u>	<u>Quiz</u>	HM Mastery Sheet #15
<u>Friday</u>	<u>No Class on Fridays (field trip)</u>	<u>NA</u>
<u>Tuesday</u> <u>10/11</u>	TBA	HM Mastery Sheet #16 & 17

Tests/Due Dates: There will be a 35 min Quiz on Thurs. Oct. 6, 2011.

Quiz- Test Topics: Equation Circles, Conversions, Solving for trig questions, REVIEW of all other Material so far: Density, Perimeter/Circumference, Area (rectangles, circles), volume (rectangular prisms, Spheres), Scientific notation, Vectors & components, Pugging into equations, 1-2 Step Algebra problems, STEM Review, Extra ordinary Review, Graphs of DVAJ, Basic Trigonometry.

Special Events/News:

6th -10th graders are expected to take the PSAT's and consequently we are having some extra help sessions during academic club time as well as Saturdays 10:00am to 12:30pm Lunch will be provided.

Extraordinaries/Mastery Review Topics:

Summations, 15%, DVAJ, Trigonometry, Base 2.

Name/ Grade: _____ / Date: _____

Homework Sheet #13

1. Make corrections for your test.-
2. Get test signed..
3. Conversion Practice:
 - a. How many feet are in a mile? _____
 - b. 30m = _____ cm
 - c. 3 cm = _____ m
 - d. 12 inches ~ _____ cm
 - e. 1 meter = _____ nanometers (10^{-9} m)
 - f. 1 mm = _____ micrometers (10^{-6} m)
 - g. 50 kg ~ _____ pounds (on earth)

Algebra practice: Solve for t SHOW EACH STEP!!!!

- a. $60 = 15 t$ b. $73 = 5 t$ c. $\frac{t}{5} = 4$ d. $\frac{80}{t} = 4$

4. Write an Equation Circle for :

a. Force of a spring

$$F = -K \Delta x$$

Δx (stretch of Spring)

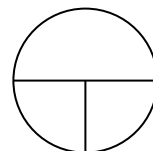
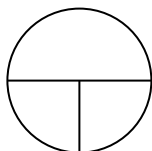
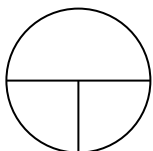
K = Spring Constant

b. Rate

$$\text{Dist} = \text{vel} \times \text{time}$$

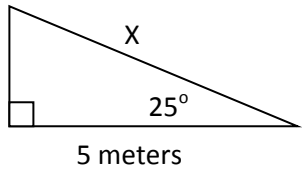
c. Work

$$W_{\text{out}} = \text{Force} \times \text{Dist}$$



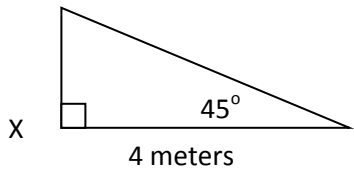
5. Trig Skills SOH CAH TOA

a.



a. Which trig function would you use? Sin Cos Tan
 b. Which trig function would you use? Sin Cos Tan

b.



Algebra Skills

c. Plug in and solve for X in problem a.

6. A car with an oil leak is moving left to right. Match the oil drop pattern with the motion word that most closely describes it.

I. Rest

II. Deceleration

III. Acceleration

IV. constant velocity

V. acceleration, then deceleration

a.



b.



c.



d.



e.



7. A force F_1 pushes on an object of mass 10 kg with a force of 500 N to the right. A force F_2 pushes on the same object with a force of 400 N to the left.

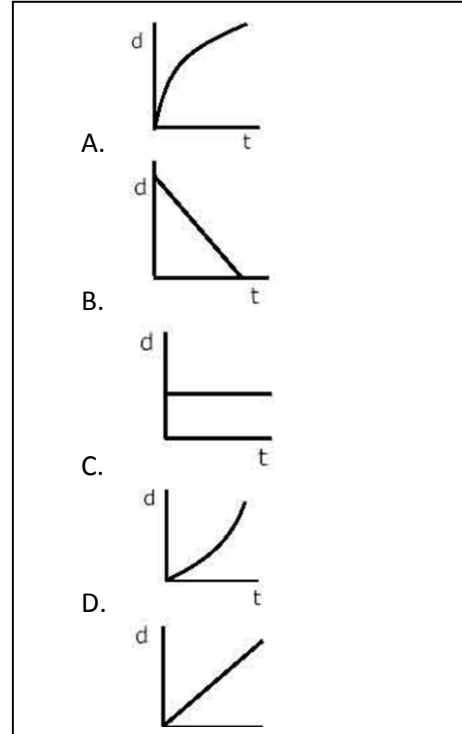
a. What is the net force on the object? _____

b. What is the acceleration of the object? (Choose from below)

- (A) 0.3 m/s² to the right
- (B) 0.5 m/s² to the left
- (C) 1 m/s² to the right
- (D) 1.5 m/s² to the left
- (E) 10 m/s² to the right

8. Match the distance vs time graph with the motion phrase that most closely

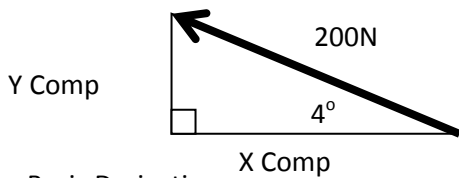
- I. An object at rest
- II. constant positive velocity
- III. increasing velocity
- IV. decreasing velocity
- V. constant negative velocity



5. Fermi: Estimate how many times have you exhaled in the last 30 days? Show work for Credit and give answer to the nearest order of magnitude (power of 10).

Physics Review Questions of the Week

6.

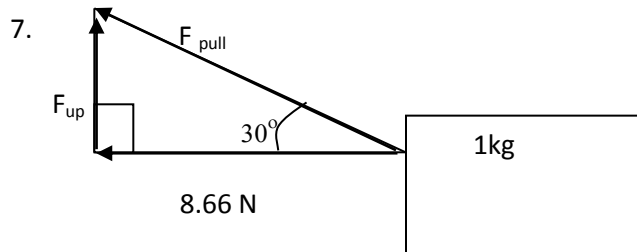


- a. What is the x component of the 200 N vector
? _____
- b. What is the y component of the 200 N vector
? _____

Basic Derivatives:

- 1. $D = -4t^3$
- a. $V =$ _____
- b. $A =$ _____
- c. What is D if $t = 2$ seconds? _____

Trigonometry: Bonus



- a. What trig function would you use to solve for F_{up} ?

Cos θ Sin θ Tan θ

(Circle one)

- b. What is F_{up} ?
- c. What is F_{pull} ?
- d. If the box does not move off of the ground, What is the weight of the box?
- e. What is the normal?

Name/ Grade: _____ / Date: _____

Homework Sheet #14

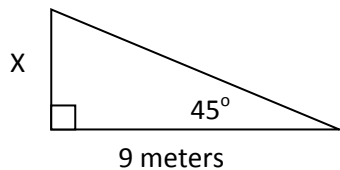
Do these as fast as you can...(if not under 90 seconds- for most) then Mastery isn't quite there....Check time before you start.. DO NOT MULTIPLY THEM OUT USE MEMORY/ MENTAL MATH ONLY!!!!

X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2																
3								█							█	
4								█							█	
5																
6																
7													█			
8								█								
9								█	█							
10									█	█						
11									█	█	█				█	
12									█	█	█	█				
13										█	█	█	█			
14											█	█	█	█		
15											█	█	█	█	█	
16															█	█

17. Did you finish these in under 2 minutes? _____

Physics Review Questions of the Week

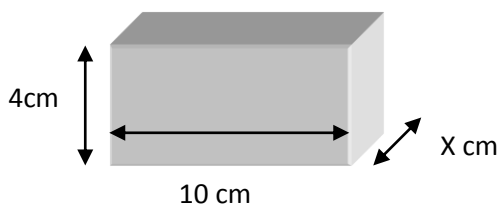
1.



a. Which trig function would you use? Sin Cos Tan
 b. Explain why you pick that one _____

c. **NOT Bonus:** X is the height of the flagpole, how tall is the flag (solve for x)?

2. a.

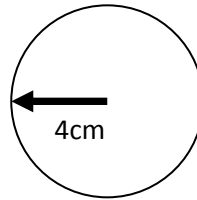


Mass = _____ gms
 Volume = _400cc_ x=____
 Density = __3gm/cc_____

Circumference of a Circle = $2 \pi r$

Area of a Circle = πr^2

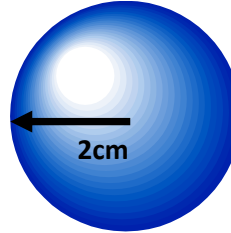
Volume of a Sphere = $\frac{4}{3} \pi r^3$



Radius of this circle is 4 cm.

Circumference = _____

AREA = _____



Radius of this sphere is 2cm

Volume = _____


3. a. 15% of 8642 = _____

b. 15% of 7000 = _____

c. d = _____ v = $3t^5$ a = _____ j = _____

4. Fermi: Estimate how many letters have you written in the past 30 days? Show work and give answer to the nearest order of magnitude (power of 10).

<p>5) Do these as fast as you can</p> <p>a. $17+8=$</p> <p>b. $17 \times 8=$</p> <p>c. $17-8=$</p> <p>d. $8-17=$</p> <p>e. $17 \div 8=$</p> <p>Arithmetic</p>	<p>6) What are the 2 steps in finding 10%?</p> <p>1. _____</p> <p>2. _____</p> <p>a. What is 10% of 2260? _____</p> <p>b. What is half of a? _____</p> <p>c. What is 15% of 2260? _____</p> <p>10 & 15 %</p>	<p>7) Newton's 3 Laws are</p> <p>a. _____</p> <p>b. _____</p> <p>c. _____</p> <p>Definitions</p>
--	--	--

<p>8) The Charge of a Neutron is? _____</p> <p>Atoms</p>	<p>9) $D = 2t^{10}$</p> <p>V=</p> <p>Slopes</p>	<p>10) A Noble gas is special because it is: <i>Circle One</i></p> <p>A. Stable</p> <p>B. Has it's outer electron shells filled.</p> <p>C. On the right side of the Periodic table.</p> <p>D. All of the above.</p> <p>Periodic Table</p>
<p>11) A palindrome is a word or number that is the same both forward and Backwards... mom, racecar, 34543 are palindromes.</p> <p>a. What is the next palindrome number after 787? _____</p> <p>b. What is the next palindrome number after 797? _____</p> <p>Algebra/ Number Sense</p>	<p>12)</p>  <p>a. How many sides? _____</p> <p>b. Name: _____</p> <p>c. If it had 5 more sides, what would it's name be then? _____</p> <p>Classification</p>	<p>13)</p> <p><u>Estimate how many finger and toe nails there are at Parkside.</u></p> <p>Estimations</p>
<p>10) 98.7° Fahrenheit is healthy body Temperature. What is 98.7° Fahrenheit temperature in Celsius? _____</p> <p>Measurement/ Number Sense</p>	<p>11) A. The atomic number is the same as the number of _____ in an atom.</p> <p>B. How many atoms in $4CO_3H_2$?</p> <p>Chemistry</p>	<p>12) How big is three baker's dozen? _____</p> <p>_____ How big is a half a mole _____</p> <p>Weekly Topics</p>

Name/ Grade: _____ / Date: _____

Homework Sheet #15

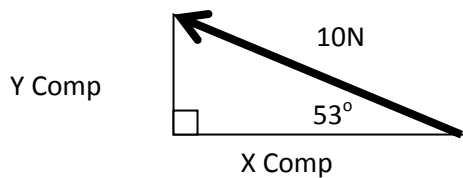
Do these as fast as you can...(if not under 90 seconds- for most) then Mastery isn't quite there....Check time before you start..

X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2																
3								□							□	
4																
5																
6														□		
7				□			□									
8								□				□				
9									□							
10										□						
11											□			□		
12					□				□			□				
13													□			
14														□		
15				□							□				□	
16																□

17. Did you finish these in under 2 minutes? _____

Physics Review Questions of the Week

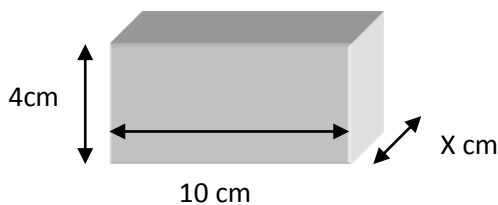
2.



- c. What is the x component of the 10 N vector
? _____
- d. What is the y component of the 10 N vector
? _____

c. **NOT Bonus:** X is the height of the flagpole, how tall is the flag (solve for x)?

2. a.

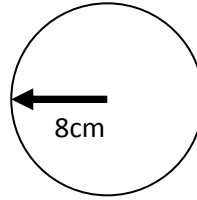


- Mass = _____ **gms**
- Volume = 300cc x= _____
- Density = 5gm/cc

Circumference of a Circle = $2 \pi r$

Area of a Circle = πr^2

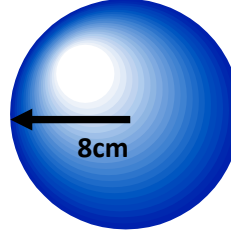
Volume of a Sphere = $\frac{4}{3} \pi r^3$



Radius of this circle is 7 cm.

Circumference = _____

AREA = _____



Radius of this sphere is 7cm

Volume = _____

3. a. 15% of 8042 = _____

b. 15% of 6040 = _____

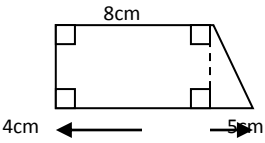
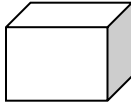
c. d = _____ v = $18t^9$ a = _____ j = _____

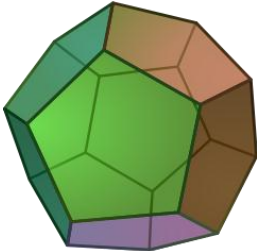
5. Fermi: Estimate how many pencils and pens have you ever used? Show work and give answer to the nearest order of magnitude (power of 10).

<p>6) Do these as fast as you can</p> <p>f. $7+8=$</p> <p>g. $7 \times 8=$</p> <p>h. $7-8=$</p> <p>i. $7 \div 8=$ (Put in Fraction Form)</p> <p>Arithmetic</p>	<p>7) What are the 3 steps in finding 15%?</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>d. What is 10% of 826? _____</p> <p>e. What is half of a? _____</p> <p>f. What is 15% of 826? _____</p> <p>10 & 15 %</p>	<p>8) The 4 types of Matter are:</p> <p>d. S _____</p> <p>e. L _____</p> <p>f. G _____</p> <p>g. P _____</p> <p>Definitions</p>
<p>9) The Charge of a Nucleus is? _____</p>	<p>10) $D=5t^7$</p> <p>V= _____</p>	<p>11) Sodium <u>is</u> or <u>is not</u> a noble gas.</p> <p>Name a Nobel gas on Sodium's row: _____</p>

<p>Atoms</p>	<p>Slopes</p>	<p>Periodic Table</p>
<p>12) A palindrome is a word or number that is the same both forward and Backwards... mom, racecar, 34543 are palindromes. 121 is a palindrome.</p> <p>c. What is the next palindrome number _____ after 12321? _____</p> <p>d. How far away is it from the first number? _____</p> <p>Algebra/ Number Sense</p>	<p>13)</p> <p>d. How many sides? _____</p> <p>e. Name: _____</p> <p>f. If it had 10 more sides, what would it's _____ name _____ be then? _____</p> <p>Classification</p>	<p>14)</p> <p><u>Estimate how many much everyone in the school weighs</u></p> <p>Estimations</p>
<p>13) 68° Fahrenheit is the room Temperature. What is 68° Fahrenheit temperature in Celsius? _____</p> <p>Measurement/ Number Sense</p>	<p>14) The atomic mass is the same as the number of _____ and _____ in an atom.</p> <p>Chemistry</p>	<p>15) How big is a dozen? _____</p> <p>_____ How big is a mole (the number not a star nosed mole) _____</p> <p>-</p> <p>Weekly Topics</p>

Homework Sheet #16

<p>1) Do these as fast as you can</p> <p>a. $18+9=$</p> <p>b. $18 \times 9=$</p> <p>c. $18-9=$</p> <p>d. $18 \div 9=$</p> <p>Arithmetic</p>	<p>2)</p> <p>a. What is 10% of 222? _____</p> <p>b. What is half of a? _____</p> <p>c. What is 15% of 222? _____</p> <p>10 & 15 %</p>	<p>3) a. What are the 3 parts of the atom?</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>Definitions</p>
<p>4) A</p> <p>Atoms</p>	<p>5) $D=5t^{12}$</p> <p>V=</p> <p>Slopes</p>	<p>6) Perimeter of a Trapezoid</p>  <p>What is the Perimeter of the trapezoid above? _____</p> <p>Area, Volume, Perimeter</p>
<p>7) What Comes next: 1,2,4,7,11,____, ____.</p> <p>Hint: How apart are the numbers?</p> <p>Algebra/ Number Sense</p>	<p>8) </p> <p>a. A. How many sides? _____</p> <p>b. Name: _____</p> <p>c. If it had 10 more sides, what would it's name be then? _____</p> <p>Classification</p>	<p>9) <u>Estimate how many minutes are in 1 day:</u> _____</p>

		Estimations
<p>10) How many Quarts are in a gallon? _____ (hint look at the name).</p> <p>Measurement/ Number Sense</p>	<p>11) The atomic MASS number is the same as the number of _____ in an atom.</p> <p>Chemistry</p>	<p>12) During what month is the earth closest to the sun? _____</p> <p>Weekly Topics</p>
<p>13) Do these as fast as you can</p> <p>a. $27+8=$</p> <p>b. $27 \times 8=$</p> <p>c. $27-38=$</p> <p>d. $27 \div 8 =$</p> <p>Arithmetic</p>	<p>14)</p> <p>a. What is 10% of 800? _____</p> <p>b. What is half of a? _____</p> <p>c. What is 15% of 800? _____</p> <p>10 & 15 %</p>	<p>15) a. Draw an Insect</p> <p>b. Draw an arachnid</p> <p>Definitions</p>
<p>16) Please draw a water molecule</p> <p>Atoms</p>	<p>17) $D = \frac{1}{2} t^8$</p> <p>V=</p> <p>Slopes</p>	<p>18) Radon is on what row of the periodic table? _____</p> <p>How many Protons are in Radon? _____</p> <p>Periodic Table</p>
<p>19) $5 \times 11 = \square + 17$</p> <p>Solve for \square</p> <p>Algebra/ Number Sense</p>	 <p>20) A. This dodecahedron is made up of _____ (Number) of _____ (shape).</p> <p>Classification</p>	<p>21) <u>Estimate</u> how many pounds your entire class weighs:</p> <p>Estimations</p>

22) About how many cm are in
1 foot? _____ how about
2 feet? _____

Measurement/ Number Sense

23) Pentane is C_5H_{12}
Draw a Butane Molecule

How many C's _____

How Many H's _____

Give the Equation: _____

Chemistry

24) Daylight savings time was
started during WWI to save

Weekly Topics

Name/ Grade: _____ / Date: _____

Homework Sheet #17

<p>1) Do these as fast as you can</p> <p>a. $99+8=$</p> <p>b. $99\times 8=$</p> <p>c. $98-9=$</p> <p>d. $279 \div 9 =$</p> <p>Arithmetic</p>	<p>2)</p> <p>a. What is 10% of 888? _____</p> <p>b. What is half of a? _____</p> <p>c. What is 15% of 888? _____</p> <p>10 & 15 %</p>	<p>3) a. A trillion has _____ zeros. Remember a million has 6 zeros...</p> <p>Definitions</p>
<p>4) Draw and Label an Atom</p> <p>Atoms</p>	<p>5) $D = 12t^{12}$</p> <p>$V =$</p> <p>Slopes</p>	<p>6) Uranium has Atomic Number 92. One Isotope of Uranium is called U-235 because it has Atomic Mass number of 235.</p> <p>a. How many Protons are in U-235? _____</p> <p>b. How many Neutrons are in U-235? _____</p> <p>Periodic Table</p>
<p>7) $3 \times 11 = \square - 22$ Solve for \square</p> <p>Algebra/ Number Sense</p>	<p>8) A. The mollusk (soft creature) with the largest brain, is also a Cephalopod (with tentacles) and has 8 legs and squirts ink. Relatives include the squid and cuttlefish. Name that mollusk _____</p> <p>Classification</p>	<p>9) <u>Estimate</u> how long it would take to walk to Chicago (1000 miles away).</p> <p>Estimations</p>

<p>10) 32° Fahrenheit is the Freezing Temperature of water. What is 32° Fahrenheit temperature in Celsius?_____</p> <p>Measurement/ Number Sense</p>	<p>11) How many atoms. a. 3 CaCO₃ _____ b. 4 C₆ H₁₁ O₅ _____ (Bonus)</p> <p>Chemistry</p>	<p>12) What is the Shortest day of the year?_____ and what holiday is it close to?_____</p> <p>Weekly Topics</p>
<p>13) Do these as fast as you can</p> <p>a. 27+88=</p> <p>b. 17x8=</p> <p>c. 87-98 =</p> <p>d. $279 \div 3 =$</p> <p>Arithmetic</p>	<p>14) .</p> <p>a. Round 788 to the nearest 100_____</p> <p>b. What is 10% of a? _____</p> <p>c. What is half of a? _____</p> <p>d. What is 15% of a? _____</p> <p>10 & 15 %</p>	<p>15) a. Bridges are made of components that are in Compression-being squeezed, or Tension – being _____.</p> <p>Definitions</p>
<p>16) Palindrome Time</p> <p>What is the next Palindrome after 2992? _____</p> <p>How far is it from 2992? _____</p> <p>Number Sense</p>	<p>17) D= 14t¹⁴</p> <p>V=</p> <p>Slopes</p>	<p>18) What comes next: 4, 14, 5, 15, 7, 17, 10, 20, 14, _____, _____</p> <p>Hint: find the distances between.</p> <p>Patterns</p>
<p>19) 4*11= 2x <input type="checkbox"/> Solve for <input type="checkbox"/></p> <p>Algebra/ Number Sense</p>	<p>20) A. <u>Perry the Platypus</u> is what type of animal?</p> <p><i>Bird, Reptile, Mammal, Fish?</i> Circle one</p> <p>Classification</p>	<p>21) <u>Estimate</u> how many days have you been around the sun?</p> <p>Estimations</p>
<p>22) 32° Fahrenheit is the Freezing Temperature of water. What is 32° Fahrenheit temperature in Celsius?_____</p> <p>Measurement/ Number Sense</p>	<p>23) How many Protons & Neutrons C has 6 p's, 6 n's; H has 1 p, 0-n's; O has 8 p's, 8 n's</p> <p>a. Ethane C₂H₆: _____-p's _____-n's</p> <p>b. 3 H₂O: _____-p's _____-n's</p> <p>Chemistry</p>	<p>24) About what day of the month (March, June, Sept. & December) do the seasons change?: _____</p> <p>Weekly Topics</p>