Summer Reading Assignment

AP Physics -1 Mrs. Pandya

2022-23

Welcome to AP Physics 1!!!

About the course: The AP Physics 1 Course has been designed by the College Board as a course equivalent to the algebra-based college-level physics class. See course syllabus for details. The course will meet for 50 minutes every day. Lab work is integral to the understanding of the concepts in this course. At the end of the course, students will take the AP Physics 1 Exam, which will test their knowledge of both the concepts taught in the classroom and their use of the correct formulas.

Regarding above here is some basic activity given. Write your answers on separate paper and will discuss it on our first day of school. Enjoy your summer!!!

Part 1: Scientific Notation and Dimensional Analysis

A. Convert the following:

1.23.4 kilograms into grams.

2. 560 nm into meters

3.4.9 x 10^6 m/s into km/h

4. 3.25x 10^8 km/h into m/s

5.76890000 s into Ms(mega second)

B. Rules for exponents

- When numbers are multiplied together, you (add/subtract) the exponents and (multiply /divide) the bases
- When numbers are divided, you (add/subtract) the exponents and (multiply/divide) the bases.
- When an exponent is raised to another exponent, you (add/subtract/multiply/divide) the exponent.

Using above the three laws, simply the following numbers in proper scientific notation.

1. $(3 \times 10^6)(2 \times 10^4) =$

2. $(6 \times 10^8)(8 \times 10^{-4}) =$

3. $(7 \times 10^3)^2 =$

4. $(9 \times 10^3)/(3 \times 10^5) =$

5. $(1.2 \times 10^4)/(6 \times 10^{-2}) =$

C. Express the following numbers in scientific notation.

1.5. 640,000kg

2.0.00000007m

3.0.0056m/s

4. 98257.26 s

5.400 m

Part 2: Algebra Review

A. Directions: Solve the following equations for the given variable and conditions. Simplify if needed.

1. $\Delta x = v_0 + \frac{1}{2}at^2$, solve for t and a
2. $V_f = v_0 + at$, solve for t
3. $mg\sin\Theta = \mu mg\cos\Theta$, solve for Θ
4. $T = 2\pi\sqrt{\quad}$, solve for l.
5. $F = G \frac{m_1 m_2}{\quad}$, solve for r.
6. $\frac{mv^2}{r} = G\frac{Mm}{r^2}$, solve for v
7. $T = 2\pi\sqrt{\quad}$, solve for k

8. mgh+ ½mv^2 = ½ ب^2 ,solve for ب

B. For problems 1-6 use, the equations below.

K= ½mv^2 W= F (Δx) cosΘ P= $\frac{W}{t}$

ΔU_g = mgh U_s = ½kx^2 P= Fv_{avg}cosΘ 1. Use the first equation to solve for K if m=12 kg and v=2 m/s.

2. If ΔUg = 10 J, m= 10 kg and g= 9.8 m/s^2, find h using the second equation.

3. K= ΔU_g, g= 9.8 m/s^2, and h= 10 m. Find v.

4. The third equation can be used to find W if you know that F is 10 N, Δx is 12 m, and Θ is 180^0.

5. Given U_s = 12 joules, and x= - 0.5 m, find k using the fourth equation.

6. For P=2100 W, F=30 N and Θ = 0^0 v_{avg} using the last equation in this section.

7. For P= 2100 W, F = 30 N, and Θ = 0^0, find v_{avg} using the last equation in this section

C. Use the equations in each problem to solve the specifies variable in the given terms. Simplify.

i) F_c = ma_c and a_c = $\frac{v^2}{r}$, Solve for r in terms of F_c, m and v. ii) T= 2π$\sqrt{\frac{L}{g}}$ and T= $\frac{1}{f}$. Solve for L in terms of π, g, and f. **Part 3: Trigonometry Review**

Complete the table below.

Θ	0^0	30^0	45^0	60^0	90^0

sin Θ
cos Θ
tan Θ

Part 4: Graphical Analysis

1. Sketch the shape of each types of y vs x function below, k is listed as constant of proportionality.

$y=kx$ $y= k/x$ $y= k/x^2$ $y= kx^2$

2.A steel shpere is dropped from rest and the distance of the fall is given by the equation $D= \frac{1}{2}gt^2$. D is the distance fallen and t is the time of the fall. The acceleration due to gravity is the constant known as g. Below is a table showing information on the first two meters of the sphere's descent.

Distance of Fall (m) 0.10 0.50 1.00 1.70 2.00 Time of fall (s)
0.14 0.32 0.46 0.59 0.63

(a) Draw a line of best fit for the distance vs. time graph above.

(b) If only the variables D and t are used, what quantities should the student graph in order to produce a linear relationship between the two quantities? (c) On the grid below, plot the data points for the quantities you have identified in part (b), and sketch the straight-line fit to the points. Label your axes and show the scale that you have chosen for the graph

.

(d) Calculate the value of g by using the slope of the graph.