AP Physics

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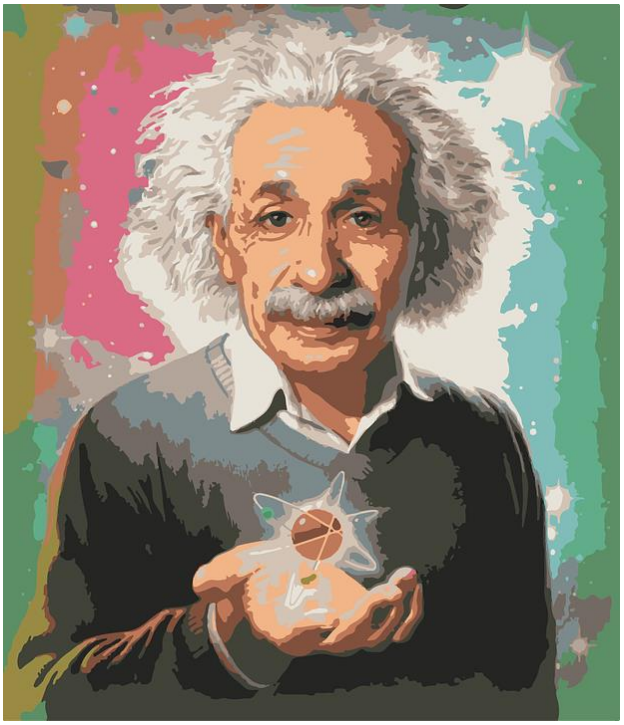
Use the AP Physics Summer Assignment to review key concepts and watch all assigned instructional videos before beginning the assignment. After completing the review, print the document or use notebook paper to complete all problems. You must show all work for each problem and clearly demonstrate your steps and reasoning. This assignment must be completed independently and should reflect your best effort. The completed work will be turned in on the first day of school.

Name: _____

AP Physics: Summer Packet



“Education is not the learning of facts, but the training of the mind to think.” – Albert Einstein

The following assignments comes from material that you should have previously learned from your past math classes. These topics will be essential for your success in Physics and you will be lost without a solid foundation of the following topics. If for any reason you are struggling with the material it is your responsibility to gain a better understanding of it through: Khan academy, YouTube, Tutor, or Textbook.

Physics is unlike any subject you have taken before and it will constantly test not what you memorized, but your ability to apply the knowledge you gained.

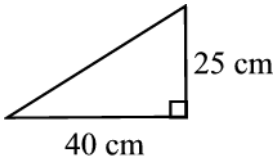
Website and Channels that can help you relearn the material:
https://www.khanacademy.org/
https://www.youtube.com/@misterwootube

Geometry & Trigonometry

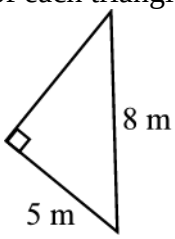
Answer the following questions using Pythagorean theorem, trigonometric functions and inverse trigonometric functions. For full credit, be sure to show your setup and work for each problem.

1. Fill in the missing side of each triangle:

a)

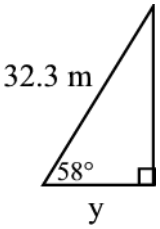


b)

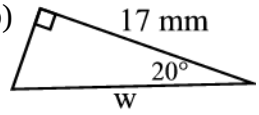


2. Find the marked side of each triangle:

a)

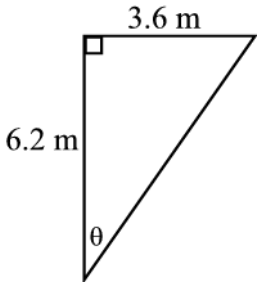


b)

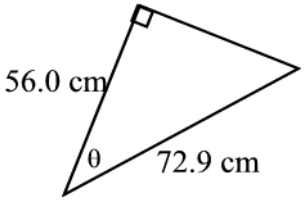


3. Find the value for the marked angle

a)

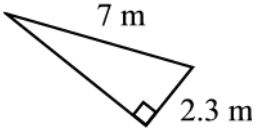


b)



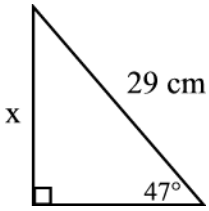
4. Fill in the missing side of each triangle:

a) (3 pts)

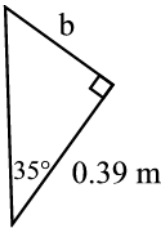


5. Find the marked side of each triangle:

a)

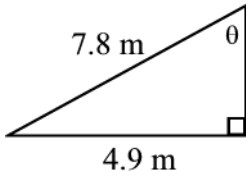


b)

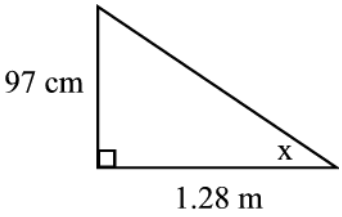


6. Find the value for the marked angle

a)



b)



Dimensional Analysis

7. Although it is widely believed that Germany's Autobahn highway has no speed limit whatsoever, much of the highway has regulated speed limits of 130 km/hr or less, and in some places speed is limited to just 60 km/hr.
a. How many miles per hour is 130 km/hr? (1 mile = 1.61 km)
b. How many miles per hour is 60 km/hr?

8. If you are traveling at 65 miles per hour, how many feet will you be traveling in one second? (There are 5,280 feet in one mile.)

9. The speed of light is 3 x 10^8 meters/second. What is the speed of light in miles/year? (1609 meters = 1 mile)

10. What is 130 meters per second into miles per hour?

11. What is 1100 feet per second into miles per hour?

12. What is 53 yards per hour into inches per week?

13. An Audi R8 V10 can go 196 mi/hr. How fast is this in m/s? (1 mile = 1609 meters) [3 pts]

14. 721 lbs per week into kg per second (1 kg = 2.2 pounds) [3 pts]

Algebra

15. Make ***x*** the subject of the formula in each of the following cases

a) $a + 3x = y + z$

b) $\frac{x}{a} = 1 + \frac{y}{b}$

c) $y = \frac{x+a}{x-a}$

d) $\sqrt{x} - 3 = y$

e) $a + x = y + z$

f) $\frac{x+y}{y} = \frac{y}{a} + \frac{a}{y}$

g) $\frac{y}{x} + a = b$

h) $\sqrt{x+3} = y$

Solve each equation with the quadratic formula.

1) $m^2 - 5m - 14 = 0$

2) $b^2 - 4b + 4 = 0$

3) $2m^2 + 2m - 12 = 0$

4) $2x^2 - 3x - 5 = 0$

5) $x^2 + 4x + 3 = 0$

6) $2x^2 + 3x - 20 = 0$

Video Analysis

Physics will be unlike any subject you have ever taken before. As a teacher, I have discovered that students that develop an interest over the subject and come into the class with lots of physics questions like, “Why is the sky blue?” often do the best in the class. That being said I’m going to post some YouTube channels. From the following list of sites, watch at least **3** of the videos that compel your interests, and write a paragraph or two about what you learned from each (why did you choose this video, what surprised you, what new ideas or questions does it make you think of, etc). This work will be collected, along with your work from Part 1, on the first day of school. Please type and print your video response paragraphs. Of course, feel free to watch more than three!

https://www.youtube.com/user/1veritasium

https://www.youtube.com/user/destinws2

https://www.youtube.com/user/minutephysics