

The Summer Math Review for Honors Physics

This assignment is meant to have you review all of the required math skills expected for this class. The study of physics at any advanced level requires the student to be very proficient in the fundamentals of algebra, geometry and some forms of trigonometry. My honors physics class will seem at times to a 2nd math course. Most of question you will answer for homework will be in the form of a word problem.

It is very important that you complete the entire assignment using your abilities. Copying someone's answers is not acceptable and will only provide a small grade boost. Asking for help is very acceptable from your parents, friends, and the internet, me... Remember, colleges and employers want people who can take the initiative in finding help.

This assignment requires use of math skills that are considered routine in Honors Physics. This includes knowledge of the metric system, scientific notation, significant figures and dimensional analysis as well as algebra and geometry.

This math assignment, as well as all other math assignments are due on the first day of physics class.

9) Determine the value of the following sums or differences, WITH the correct number of significant figures

- a. $95.32 \text{ km} + 102.5 \text{ km} + 77 \text{ km}$
- b. $0.005070 \text{ cm} + 6.900 \text{ cm} + 2000.860 \text{ cm}$
- c. $93.20 \text{ kg} + 10.975 \text{ kg}$

10) Using scientific notation, express the speed of light $299,792,458 \text{ m/s}$ with

- a. 2 sig figs
- b. 4 sig figs
- c. 7 sig figs

11) Do the following product or quotient with the correct number of sig figs.

- a. $1275 \text{ kg} / 120 \text{ L}$
- b. $(121.20 \text{ cm})(23 \text{ cm})$
- c. $91.23 \text{ m} / 11.470 \text{ m}$

Place the answer to the following problems in scientific notation (if appropriate) and simplify the units. Working with the units can verify you are calculating correctly and for the right value.

12) $K = \frac{1}{2} (6.6 \times 10^2 \text{ kg}) (2.11 \times 10^4 \text{ m/s})^2 =$ value (magnitude) = _____

Simplified units for answer = _____

13) $F = (9.0 \times 10^9 \text{ Nm}^2 / \text{C}^2) (3.2 \times 10^{-9} \text{ C})(9.6 \times 10^{-9} \text{ C}) / (0.32\text{m})^2 =$

Value of answer = _____ Simplified units of answer = _____

Use right triangle trigonometry to solve the following problems. SOHCAHTOA is very useful in solving these problems. This math WILL be retaught in class this school year, so do not worry if you do not have a lot of experience with it.

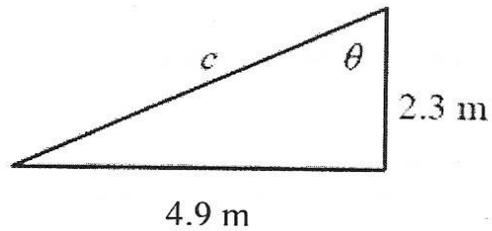
14) The gondola ski lift at Keystone, Colorado ski resort is 2830 m long. On average, the ski lift rises 14.6 degrees above horizontal. How high is the top of the ski lift relative to the base? Draw a picture to help set up the information given and needed.

15) Two hot-air balloons are 48.2 m (on left) and 61.0 m (on right) above the ground at the same point in time. A person in the left balloon observes that the right balloon is 13.3° above the horizontal. What is the horizontal distance between the two balloons?

16) Calculate the following unknowns and remember to write all answers with correct units. Assume all triangles are right triangles

$c =$ _____

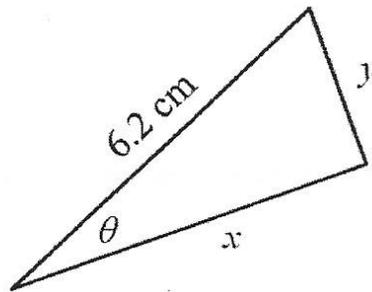
$\theta =$ _____



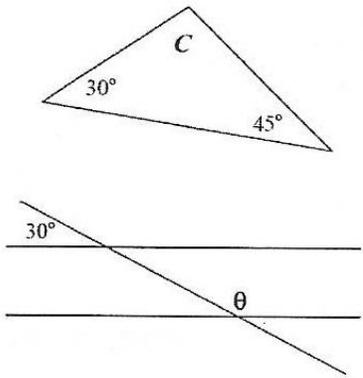
$x =$ _____

$y =$ _____

$\theta = 17.0^\circ$

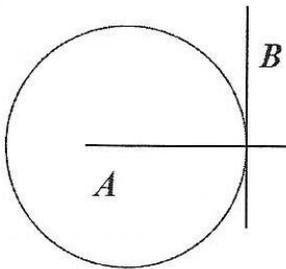


Some problems based on geometry.



17) What is the values of angle C?

18) What is the angle θ ?



Line B touches the circle at a single point. Line A extends through the center of the circle.

Question 19

a) What is the name of the type of line that intersects a circle at a single point? _____

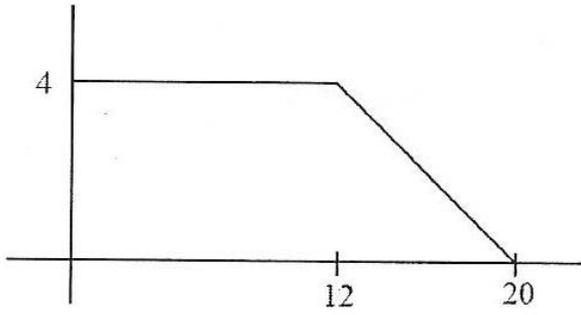
b) What is line A in relation to the line B?

c) What is the angle between the 2 lines?

20) The radius of a circle is 5.5 cm

a) what is the circumference in cm _____ in meters _____

b) What is the circle's area in cm^2 _____ in m^2 _____



21) What is the area of the space enclosed between the graph and the two axes?