

2009 Physics Basics 1

1. Have your Lab Safety and Class Rules sheet signed. (And actually bring it to class.)
2. Acquire a scientific calculator. It needs to have sin, cos, and tan. The graphing calculators are best, since we can see what you entered. You can borrow one from the school. You can also get a small, less expensive one. Preferably it should be solar. I like the TI-30. Purchase a calculator or get one of the school's.
3. Why are closed-toed shoes required in the lab?
4. Give two reasons that we would need to wear goggles in a physics lab.
5. If someone has an idea for an experiment that you have never done before, should you do it? Why or why not?

Go to the Mr. Murray's website and answer the following:

6. List the songs that are on Mr. Murray's Website (found in "Study Helps").
7. Go to Study Helps, then Physics Study Helps, then Kinematic Equations. Do the first study help: "Kinematic Variables".
 - A) What are the units for acceleration?
 - B) What does Δy stand for?
 - C) What does v_i stand for?

Scientific Notation:

Scientific notation is how we write very large or very small numbers. It is faster to write and is easier to read.

0.000000045 = 4.5×10^{-8}
Hard to read. Easy to read.

Reading

Positive exponents are for large numbers. Negative exponents are for small numbers.

Positive exponents tell you how many zeros to add to the right of the number.

$$1.2 \times 10^3 = 1.2 \times 1000 = 1,200$$

Read as: "1.2 times 10 to the third"

Negative exponents tell you how many times to move the decimal to the left.

$$6.1 \times 10^{-3} = 6.1 \times \frac{1}{1000} = \frac{6.1}{1000} = 0.0061$$

Read as: "6.1 times 10 to the negative third"

Writing

When writing scientific notation, only one digit is on the left of the decimal. Any other significant numbers are to the right of the decimal.

$$541,022 \text{ becomes } 5.41022 \times 10^5$$

$$\begin{array}{ll} 34.5 \times 10^4 & 3.45 \times 10^5 \\ \text{WRONG!} & \text{CORRECT!} \end{array}$$

8. Write the following numbers in scientific notation.
 - A. 12,756 km (diameter of the earth) =
 - B. 0.082 =
 - C. 702,000,000 =
 - D. 0.00000000000000000000000000000000000000266 = (mass of an oxygen atom) [thus why we like scientific notation]
22. Write out these numbers in standard notation.
 - A. 5.902×10^{-4} =
 - B. 3×10^8 m/s (the speed of light) =
 - C. 9.11×10^{-31} kg (the mass of an electron) =

23. Someone writes 18.3×10^4 . Correct them.

$$8 \left(\frac{4}{2} \right) = \frac{8}{1} \left(\frac{4}{2} \right) = 8 \times 4 \div 2$$

$$\frac{8}{1} \left(\frac{4}{2} \right) = \frac{32}{2} = 16$$

O R

24. Given: $6 \left(\frac{5}{2} \right) =$
 - A. Which one or ones are in the multiplication position?
 - B. Which one or ones are in the division position?
 - C. Do the math (solve). $6 \left(\frac{5}{2} \right) =$

$$\frac{8}{1} \left(\frac{4}{2} \right) = \frac{8}{2} \left(\frac{4}{1} \right) = 4(4) = 16$$

(MORE ON BACK)

From the “Conversion” Notes:

25. Anything divided by itself =

A. $\frac{6}{6} =$

B. $\frac{15}{15} =$

C. $\frac{\text{km}}{\text{km}} =$

D. Anything divided by itself =

26. A. Will this work right? $\frac{16 \text{ m}}{1 \text{ sec}} \left(\frac{1 \text{ m}}{3.3 \text{ ft}} \right) =$

B. Justify your answer (why or why not)?

27. Following the notes EXACTLY: Convert 15 cm to inches. (Must show work.)

3.3 ft = 1 m 5280 ft = 1 mi
 12 in = 1 ft 2.54 cm = 1 in.
 I assume you know about seconds, mins, etc

28. Convert 120 m/sec to m/min. (Follow the steps)

From the “Metrics” Notes:

29. How many years in a century?

30. How many cents in a dollar?

31. How many centimeters in a meter?

32. How many years in a millennium?

33. How many millimeters in a meter?

34. Convert the following to meters:

A. 50 cm =

B. 20 cm =

C. 5 cm =

D. 43 cm =

E. 900 mm =

F. 100 mm =

G. 45 mm =

From the “Linear Equations” Notes:

Again, follow the notes EXACTLY!

35. Use the graph at the right to answer the following:

A. How many “good points” are there?

B. Calculate the slope of the line.
 (Study Help available)

C. What is the y-intercept for this line?

D. Write the linear equation for this line.

