

HW due Thursday 9/6/07

READ. 12 - 18: Measurement, Graphing, & Relationships
DO P.25 #54, P. 26 # 67, 70, 74, 77, and P. 28 # 94

P. 25 #54

Two students measure the speed of light. One obtains

$(3.001 \pm 0.001) \times 10^8$ m/s;

the other obtains $2.999 \pm 0.006) \times 10^8$ m/s.

a.) Which is more precise?

b.) Which is more accurate?

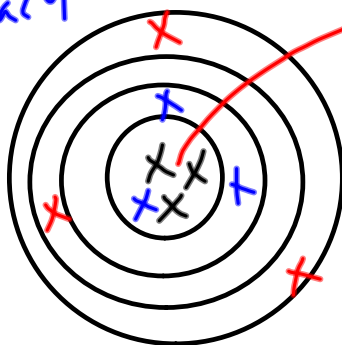
$3.001 \pm .001$

$2.999 \pm .006$

* actual value

$c = 2.99792458 \times 10^8$ m/s

not precise
 good accuracy



precise + accurate

x x
 x

- precise

- not accurate

P. 26 # 67

Convert each of the following measurements to meters.

- a.) $42.3 \text{ cm} = .423 \text{ m}$
- b.) $6.2 \text{ pm} = 6.2 \times 10^{-12} \text{ m}$
- c.) $21 \text{ km} = 21,000 \text{ m} = 2.1 \times 10^4 \text{ m}$
- d.) $0.023 \text{ mm} = 2.3 \times 10^{-5} \text{ m} = .023 \times 10^{-3} \text{ m}$
- e.) $214 \text{ } \mu\text{m} = 214 \times 10^{-6} \text{ m} = 2.14 \times 10^{-4} \text{ m}$
- f.) $57 \text{ nm} = 57 \times 10^{-9} \text{ m} = 5.7 \times 10^{-8} \text{ m}$

P. 26 # 70

State the number of significant digits in each of the following measurements.

- a.) 0.00003 m (1)
- b.) 64.01 fm (4)
- c.) 80.001 m (5)
- d.) 0.720 μg (3)
- e.) $2.40 \times 10^6 \text{ kg}$ (3)
- f.) $6 \times 10^8 \text{ kg}$ (1)
- g.) $4.07 \times 10^{16} \text{ m}$ (3)

P. 26 #74

Dimensional Analysis

Pressure is measured in Pascals, where $1 \text{ Pa} = 1 \text{ kg/ms}^2$.
Will the following expression give a pressure in the correct units?

$$\frac{(0.55 \text{ kg})(2.1 \text{ m/s})}{9.8 \text{ m/s}^2} = \frac{(\text{kg})(\cancel{\text{m/s}})}{(\cancel{\text{m/s}^2})} = \frac{\text{kg}}{\cancel{\text{s}}} \times \frac{\cancel{\text{s}}}{\text{s}^2} = \frac{\text{kg}}{\text{s}^2}$$

NO

P. 26 # 77

The sides of a quadrangular plot of land are 132.68 m, 48.3 m, 132.736 m, and 48.37 m. What is the perimeter of the land plot?



$$362.\underline{0}86 \text{ m}$$

$$362.1 \text{ m}$$

P. 28 # 94

Find the approximate mass of water in kilograms needed to fill a container that is 1.40 m long and 0.600 m wide to a depth of 34.0 cm. Report your results to one significant digit.

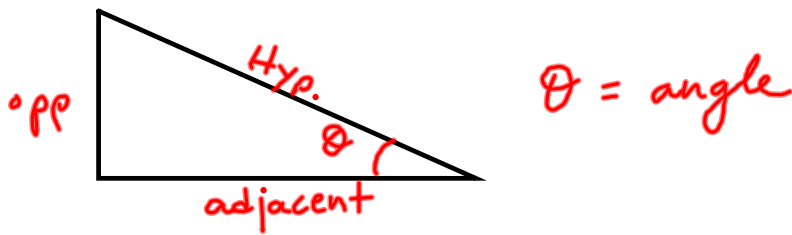
$$\text{density of } H_2O = \frac{1g}{cm^3}$$

$$\begin{aligned} Vol &= L \times w \times H \\ &= (1.40m)(0.600m)(34cm) \\ &= (140cm)(60cm)(34cm) = 285600 \text{ cm}^3 \\ V &= 285600 \text{ cm}^3 \end{aligned}$$

$$\begin{aligned} D = \frac{m}{V} &\Rightarrow m = DV = \left(\frac{1g}{cm^3}\right)(\text{cm}^3) \\ &= 285600 \text{ g} \\ &= 285.6 \text{ kg} \\ &= 300 \text{ kg} \end{aligned}$$

Review of basic Trig functions

$$2\pi \text{ radians} = 360^\circ$$



$$\sin \theta = \frac{\text{opp}}{\text{Hyp}}$$

$$\cos \theta = \frac{\text{adj.}}{\text{Hyp}}$$

$$\tan \theta = \frac{\text{opp}}{\text{Adj.}}$$

* Pre calc students need to be VERY AWARE of radians vs. degrees

Basic Algebra and order of operations...

Remember to do the same thing to BOTH sides of an equation!

Remember the hierarchy of operations!!! This is a comon error!

Use PARENTHESES not dots or x's to show multiplication!

