Phys 2110-4 1/18/13

Note Title 1/18/2013

Chap 1 Doing Physics

Subject Matter

Motion 1D, 2D

Forces $\vec{F} = m\vec{a}$

Energy (work)

Momentum

Rotations

Oscillations

Waves

Solving problems

Ignore: Gravity
Fluids
Statics
Thermal Physics

Doing physics

0.000 5789

Scientific Notation

5.789×10^{-4}

5.789 * 10^ -4

Units!

Metric
g, cm, s

kg, m, s MKS SI

Prefixes

$cm = 10^{-2} m$

$\mu s = 10^{-6} s$

Terra — 10^{15} T

Giga — 10^{12} G

Mega — 10^{6} M

kilo — 10^{3} k

— 10^{0}

centi — 10^{-2}

milli — 10^{-3} m

micro — 10^{-6} μ

nano — 10^{-9} n

pico — 10^{-12} p

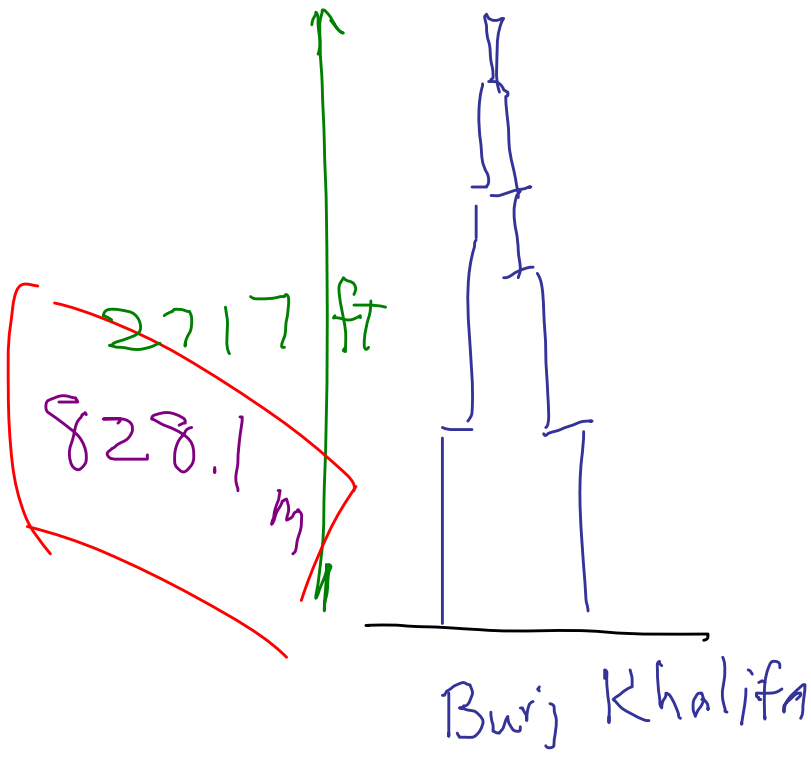
Converting Units

"Multiply by 1" method

Convert to m

$$(2717\ \text{ft})\left[\frac{0.3048\ \text{m}}{1\ \text{ft}}\right] = [828.1\ \text{m}]$$

$1\ \text{ft} = 0.3048\ \text{m}$



Convert $70\ \frac{mi}{hr}$ convert $\frac{m}{s}$

$$\left(70\ \frac{mi}{h}\right)\left(\frac{1\ h}{3600\ s}\right)\left(\frac{5280\ ft}{1\ mi}\right)\left(\frac{0.3048\ m}{1\ ft}\right) = 31.3\ \frac{m}{s}$$

$$\left(2.71\ \frac{g}{cm^3}\right)\left(\frac{10^{-3}\ kg}{1\ g}\right)\left(\frac{100\ cm}{1\ m}\right)^3 = 2.71\times10^{3}\ \frac{kg}{m^3}$$

$4.730\times10^{7}\ \frac{kg\ m^2}{s^3}$

Uncertainty

$(4.730 \pm 0.005)\times10^{7}$

$(3.25)(8.7) = 2.8275$

3.254
3.246

8.74
8.66

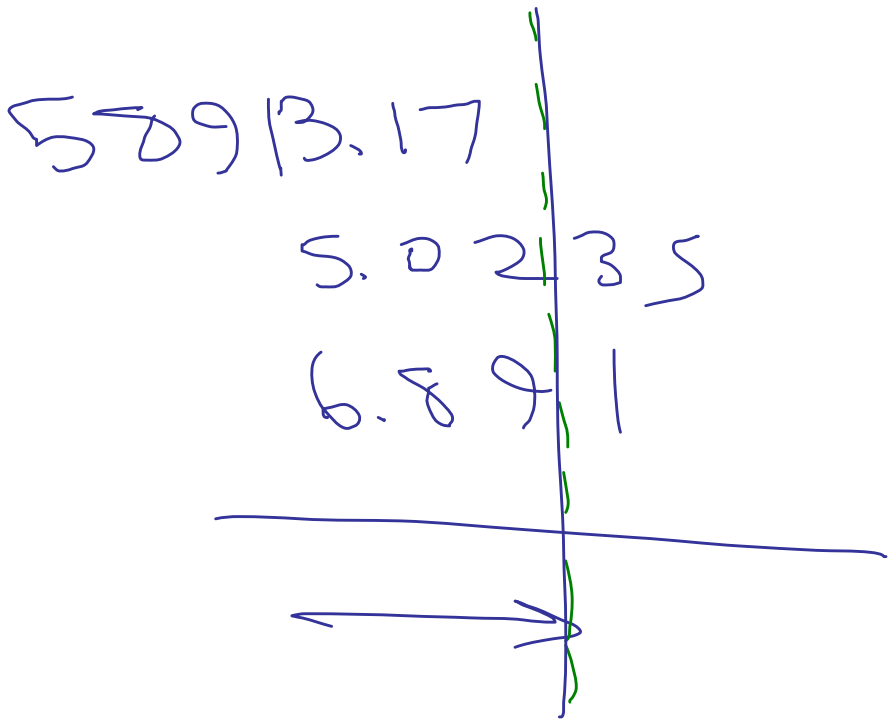
0.00017
1.7×10^{-4}
$\approx$

2.8

Count the # of known figures

3, 2

Answer is rounded to the least of these



"Sig Figs"

9.173580042

wrong

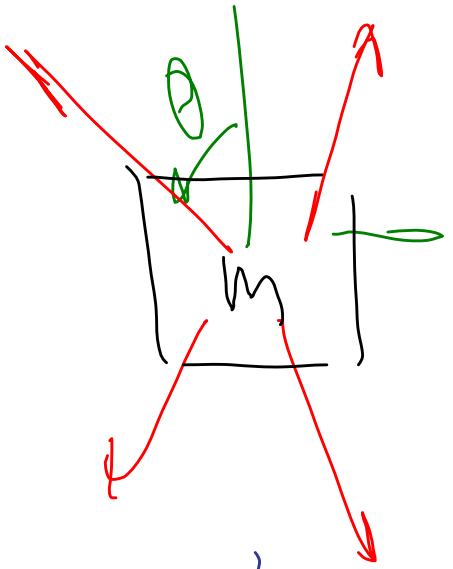
Problem Solving

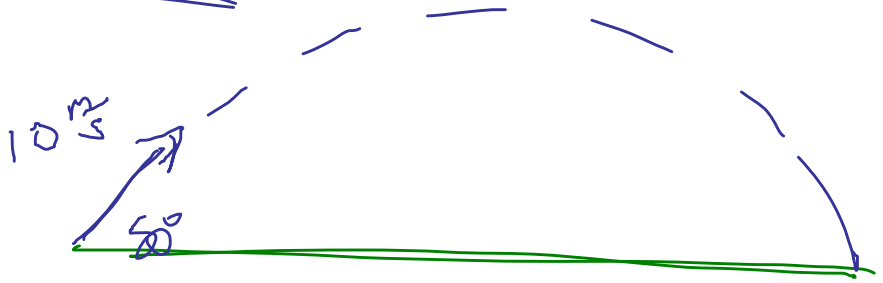
Read, try to picture it mentally

Draw a picture

IDEA

Plausible?





How does it spend in air.

Chap 2 Motion in 1 Dimension

+ Chap 3

Start off simple

1-D