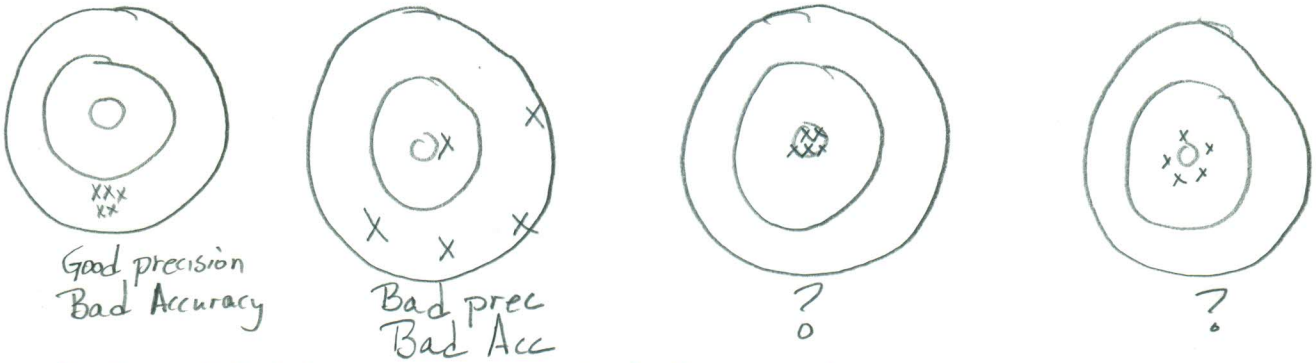
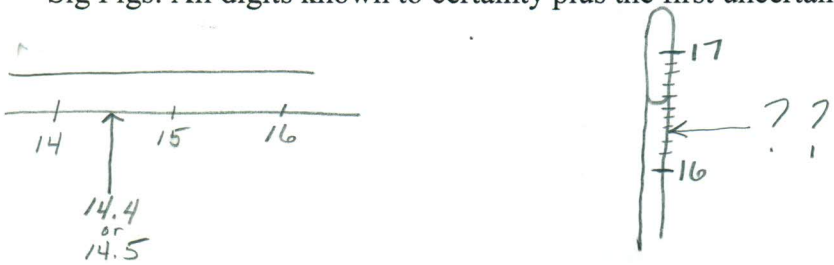
BASICS
Honors Physics

* estimated uncertainty: $40 \pm 5 \rightarrow 35 - 45$
* percent uncertainty : $40 \pm 5\% \rightarrow 38 - 42$

Precision: the agreement among several measurements that have been made the same way
Accuracy : the closeness of a measurement to the accepted value for a specific physical quantity



Sig Figs: All digits known to certainty plus the first uncertain one



Ex: 50 – 1 655-3 400-1 400.0-4 50 dogs-∞(infinity) 4.00×10^{6}-3 .0005-1 .000500-3

What about: 5.00, 7000, 4.500, 75 desks, 5.9990×10^{-8}, .0005, 1.00000, .00040, 1000

????: How would I express 1000 with 2 and 3 sig figs

Rules for sig figs:

--add/subtract: line up decimal

$$\begin{array}{r} 5.00 \\ +\ 3.142678 \\ \hline 8.142678 \end{array}$$

First stop

8.43

$$\begin{array}{r} 9.46783 \\ -\ 4.172 \\ \hline 5.29583 \end{array}$$

5.296

--Mult/div: least sig figs

$5^{(1)} \times 342^{(3)} = 1710 \Rightarrow \boxed{2000}$ (1) ← # sig figs

$5.0^{(2)} \div 5647^{(4)} = .0008854 \Rightarrow \boxed{.00089}$ (2)

Try these: 7.3+4.007 9.84-4 3.42÷9.7 5.00x43 7.900x4.5

SCIENTIFIC METHOD: Observing
Hypothesizing
Experimenting
Theorizing → testing

Relative Error

$E_r = \frac{|O-A|}{A} \times 100\%$

basic conversions: 2.54 cm = inch 1 cm^3 = ml

$6 inch \rightarrow cm \Rightarrow \frac{6 in \mid 2.54 cm}{1 in} = \boxed{15.24 cm}$

$50 m/s \rightarrow Km/hr \Rightarrow \frac{50 m \mid Km \mid 3600 s}{s \mid 1000 m \mid hr} =$

$4.5 yd^2 \rightarrow ft^2 \Rightarrow \frac{4.5 yd^2 \mid 3ft \mid 3ft}{yd \mid yd} =$

Try these $55 mi/hr \rightarrow ft/s$

$60{,}000 in \rightarrow Miles$

$950 cm \rightarrow ft$

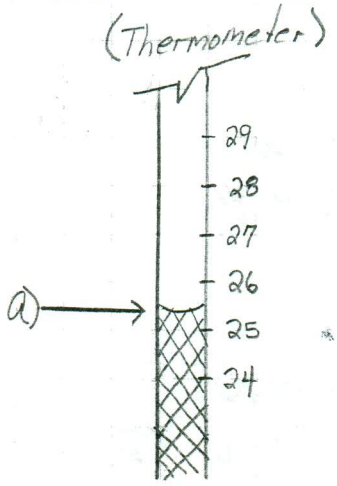
$350{,}000 cm^3 \rightarrow m^3$

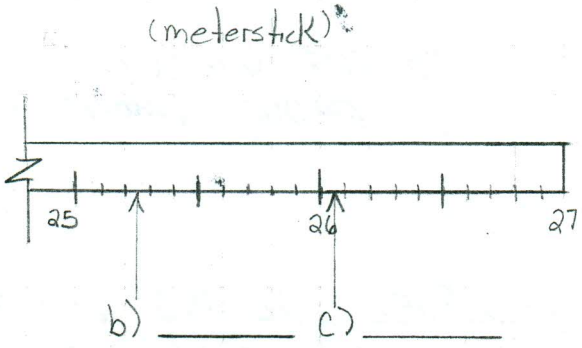
Physics
Ch # 0 Sig figs

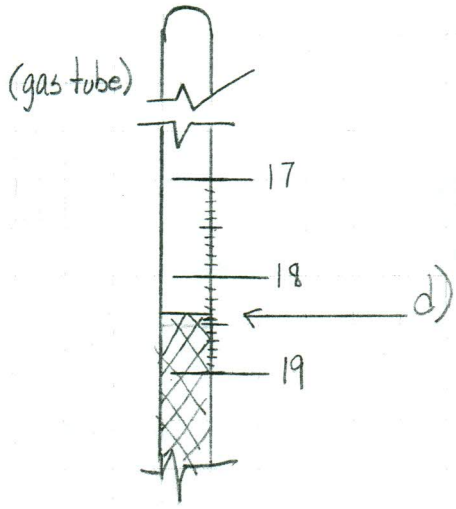
name:

1) Define Significant figures (Sig Figs)

2) Determine each measurement using Sig Figs







3) How many sig figs do the following have.

Example a) 5.72
b) .402
c) 500
d) 400.0
e) 1.020
f) 6000.0
g) 7000
h) .00056
i) .070
j) 1.20×10^3
J) 1.000×10^3
K) .0600
L) 1.040×10^{-3}
M) $40\bar{0}0$
N) 1.000

4) Perform the given operations, Give final answer in correct Sig Figs.

a) $4.6 + 2.00 + 4.82756$
b) $.0056 \cdot 40{,}000$
c) $25 \div 732$

d) $10.3 - 4.728$ e) $5 \times 2.7 \times 3.628$ f) $4.0 \div .06253$

5) Given the following scenarios, define whether the given is precision and/or Accuracy or neither. Also, state WHY

a) Given value for gravity: $32.2 \frac{ft}{s^2}$.
Observed values: 45, 44, 46, 48, 45 (each in $\frac{ft}{s^2}$)

b) A measured distance: 75m.
Observed values: 72, 74, 78, 80, 77, 73 (each in m)

c) A measured velocity: 60mph
observed values: 750, 745, 760, 770 (each in mph)

d) A measured volume: 4000ml
Observed values: 4.05, 4.01, 3.999, 4.0 (each in ℓ)

e) A measure Area: $45 m^2$
observed values: 20, 75, 95, 105, 10 (each in m^2)