Math and Lab Calculations Remediation
Pride Session Assignment

Significant Digits

1. How many significant digits are in the following measurements?

246.32	5	1.008	4	107.854	6
0.00340	3	100.3	4	14.600	5
0.678	3	0.0001	1	700000	1
350.670	6	1.0000	5	320001	6

2. Calculate the answers to the appropriate number of significant figures.

$$\% \text{ Error} = \frac{|4.29 \text{ J/gc} - 4.18 \text{ J/gc}|}{4.18 \text{ J/gc}} \times 100 \qquad \text{2 significant digits}$$

$$\% \text{ Error} = \frac{|12.56 \text{ g} - 12.52 \text{ g}|}{12.52 \text{ g}} \times 100 \qquad \text{1 significant digits}$$
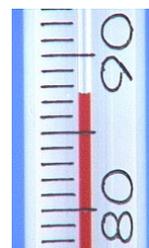
Estimating Measurements

For each example, write what measurement would you record and explain your reasoning about the number of decimal places you chose to record.

71.8° F

87.6° C

Since this electronic thermometer uses a digital readout, there is no way to estimate additional decimal places because the measurement is simply read of the display. As such, I only needed to write down the temperature displayed.

This traditional thermometer measures in whole degrees. Since this measurement is made by comparing to a scale, it is necessary to estimate 1 decimal place past the scale, so I estimated to 1/10's. Since the top of the red lies slightly above half way between 87 and 88, I recorded 87.6°C.

Density Lab

A student carries out a procedure similar to the one you did in lab. Using a graduated cylinder, she collects the following data while trying to determine the mass and volume of an colorless liquid. As you did in your lab write-up, completely represent all the calculations necessary to determine the density of the liquid. Then, calculate the percent error of your calculated density assuming the actual density of the liquid is 0.65 g/ml.

Mass of Graduated Cylinder: 43.78g
Volume of Liquid: 20.0 mL
Mass of Graduate Cylinder with Liquid: 54.32 g

Mass of Liquid

Mass of cyl & liquid	54.32 g
-Mass of cylinder	-43.78g
Mass of liquid	10.54g

Density of Liquid

$$Density = \frac{mass}{volume} = \frac{10.54 \text{ g}}{20.0 \text{ mL}} = 0.527 \text{ g/mL}$$

Percent Error

$$\%error = \frac{|meas-acc|}{acc}x100$$

$$\%error = \frac{|0.527g/ml-0.65g/ml|}{0.65g/ml}x100$$

$$\%error = \frac{0.12g/ml}{0.65g/ml}x100$$

$$\%error = 18\%$$