CHM 101 Experiment 1: Pre-Lab Exercise
The Use of Volumetric Glassware

Name:		ID:
Lab Section:	Date:	Bench No.:

All answers must be written in ink.
**** Show the steps of each calculation and apply the rule for significant figures***

1. What *precautions* must be taken when measuring the mass of an object using an electronic balance?

2. Explain why chemicals and hot objects should not be measured directly on the electronic balance?

a)

b)

3. What is a meniscus? Explain how to properly read a meniscus in a graduated cylinder?

4. The mass of a dry, 50 mL beaker is 49.135 g. The observed volume of water in a volumetric pipet is 20.00mL. This water is transferred to the beaker and the combined mass of the water and beaker is found to be 69.122 g. Given that the density of water at 24°C is 0.99732 g/mL, calculate:

a) The mass of water

b) The actual (theoretical) volume of water in the beaker

c) Percent error in the volume measurement

5. What safety precautions must one take before doing any experiment in lab?

a)

b)

c)

CHM 101 Experiment 1: Report Sheet
The Use of Volumetric Glassware

Name:		**ID:**
Lab Section:	**Date:**	**Bench No.:**

****Lab Report must be written in ink.***
****Apply the rule for significant figures in all calculations & write the correct units***

Part I. Measuring the Volume of Liquids

	Name & Capacity of Volumetric Glassware	Color of Liquid	Volume (mL)
1			
2			
3			

Part II. Comparing the Precision of Volumetric Glassware

A. The Graduated Cylinder **Density of water @22.0= 0.99780 g/mL**

		Trial #1	***Trial #2***
1	Mass of empty, dry graduated cylinder		
2	Observed volume of water in the graduated cylinder		
3	Combined mass of graduated cylinder and water		
4	Mass of water in the graduated cylinder		
*5	Calculated (theoretical) volume of water present in the graduated cylinder		
6	Difference between observed volume and calculated volume *(error in measured volume)*		
*7	Percent Error in volume		

***Show calculation(s) steps for only one trial.**

B. The Beaker

		Trial #1	***Trial #2***
1	Mass of empty, dry beaker		
2	Observed volume of water in the beaker		
3	Combined mass of beaker and water		
4	Mass of water in the beaker		
*5	Calculated (theoretical) volume of water present in the beaker		
6	Difference between observed volume and calculated volume *(error in measured volume)*		
*7	Percent Error in volume		

***Show calculation(s) steps for only one trial.**

C. The Pipet

		Trial #1	***Trial #2***
1	Mass of empty, dry beaker		
2	Observed volume of water transferred by the pipet		
3	Combined mass of beaker and water transferred by the pipet		
4	Mass of water transferred by the pipet		
*5	Calculated (theoretical) volume of water transferred by the pipet		
6	Difference between observed volume and calculated volume *(error in measured volume)*		
*7	Percent Error in volume		

***Show calculation(s) steps for only one trial.**

D. The Burette

		Trial #1	***Trial #2***
1	Mass of empty, dry beaker		
2	Initial water level in the burette		
3	Final water level in the burette		
4	Volume of water dispensed from the burette (*volume observed*)		
5	Combined mass of beaker and water dispensed from the burette		
6	Mass of water dispensed from the burette		
*7	Calculated (theoretical) volume of water dispensed from the burette		
8	Difference between observed volume and calculated volume *(error in measured volume)*		
*9	Percent Error in volume		

***Show calculation(s) steps for only one trial.**

Question

1. Which piece of volumetric glassware should be used when extremely precise measurements are needed? Explain.