Gases HW - 1 name: _____

1 Name the 4 variables that are used to describe a gas

_____ _____ _____ _____

2 The Kinetic Molecular Theory can be summed up briefly using these statements:
Gases are made up of hard spherical particles. Particle volume is insignificant to gas volume.
The particles have no attraction or repulsion for each other. Gas particles move fast and only in straight lines.
Particle collisions are elastic – collisions cause no loss of energy. The collisions of the particles result in gas pressure.
The average kinetic energy of a gas is directly proportional to the temperature of the gas in Kelvin.
Choose 2 statements & explain them Are they true? almost true? sometimes true? Or tell how they're untrue but help explain gases.

3 Draw a line graph showing the relationship between temperature in Kelvin as a function of kinetic energy

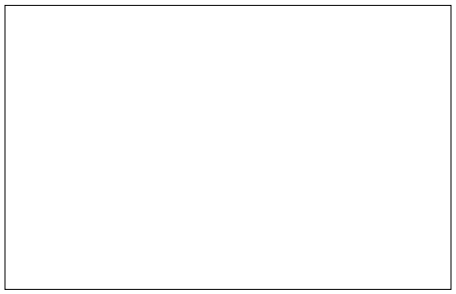
4 How many moles of helium are in a balloon of 20.5 L of helium at STP? (show work)

5. How many grams of helium are in that balloon of 20.5 liters? (show work)

6. How many atoms of helium are in that balloon of 20.5 liters? (show work)

7. You could compress 20.5 liters of helium gas into a 2.0 liter sized soda bottle. How is that possible?

5 On the back page of your reference table is the combined gas law. Write it in the box



6. Tell what do P, V, and T stand for? What about the 1 and the 2?

7. You may only use Kelvin for the temperature in this formula. Why?

Gases HW - 2 name: _____

The graphs MUST have axis labels in the correct place. Put in AXIS LABELS…

1 Draw a simple graph showing pressure as a function of volume

2 Draw a simple line graph showing volume as a function of temperature

3 Draw a simple line graph showing pressure as a function of temperature

4 Write out the combined gas law	5 Write the combined gas law with constant temperature
6 Write the combined gas law with constant pressure	7 Write the combined gas law with constant volume

8. Your balloon of 33.8 Liters and 2.33 atm is at standard temperature. When it rises into the air it cools down to just 258 Kelvin, volume expands to 39.7 Liters, what is the pressure now?

9. The gas in a closed container, at constant volume, has a pressure of 144 kPa at 30.0ºC. What will the pressure be if the temperature is lowered to -172ºC?

10. At constant temperature, calculate the volume of a gas in liters at a pressure of 100.0 kPa if it starts at a volume of 1555 mL at 120.0 kPa.

Gases HW - 3 name: _____

1 State Avogadro's Hypothesis perfectly.

2 Write chemical formulas for any two real gases. _____

3. Write out a chemical formula for any one IDEAL gas: _____

3 Under what conditions of temperature and pressure do real gases act most ideally?

4 If you have three different gases (CO_2, He, and C_3H_6) all at 125.4 kPa and 299 K, which is most ideal, and why?

5 If 32.5 L of carbon monoxide at STP is changed to 75.0 kPa at constant temperature, what is new volume?

6 The pressure on 125 L of $CO_{2(G)}$ is 101.3 kPa at 275 K. If it's chilled to 155 K and the volume changes to 65.0 liters, what is the new pressure of the $CO_{2(G)}$?

7 A sealed cylinder (constant volume) contains N_2 gas at 122 kPa pressure and a temperature of 20.0ºC. If the cylinder is left in the sun and heats to 50.0ºC. What is the new pressure inside the cylinder?

8 A gas with a volume of 4.00 L at 91.0 kPa expands until the pressure drops to 31.0 kPa. What is the new volume if the temperature remains constant?

Gas HW #4 PxV = C **GET GRAPH PAPER** name: _____

1. The _____ X _____ = a constant for a sample of gas (fill in the WORDS there)

2. A sample of chlorine gas is at a pressure of 176.5 kPa. The volume of the gas is 1.350 Liters. Calculate the constant for this sample of gas? (pay attention to units)

_____ X _____ = _____

The pressure of this sample of chlorine is changed 12 times (shown in the table below). For each pressure, calculate new volume for each. You MUST show work for the first 4 problems. Then put the volumes into the table.

SHOW WORK IN THESE BOXES

Pressure (kPa)	Volume (Liters)	
350.		3.
320.		
290.		4.
230.		
200.		
170.		5.
140.		
110.		
70.0		6.
55.0		
45.0		

7. On graph paper, draw a large, perfect graph, of this data: Pressure as a function of Volume.

8. Draw a BEST FIT curved line (do not just connect the dots). Title the graph, and then write clearly near the curve, that this is an "inversely proportional" graph.