Chemistry CP

Name: _____

Gas Law Worksheet

Section: _____

Standard Temperature and Pressure (STP): $0^{\circ}C$, 1 atm (or equivalent)

$\qquad K = {}^{\circ}C + 273$

Remember to follow the general strategy:

       List what you know

       Set up the problem

       Estimate and calculate

Charles's Law

1. A sample of gas occupies 24 m^3 at 100. K. What volume would the gas occupy at 400. K?

2. Gas in a balloon occupies 2.5L at 300. K (about room temperature). At what temperature will the balloon expand to 7.5 L?

3. The balloon from Problem 2 is dipped into liquid nitrogen that is at a temperature of 80. K. What volume will the gas in the balloon occupy at this temperature?

4. Calculate the final volume when a 75.0 mL sample of gas is heated from $5^{\circ}C$ to $60^{\circ}C$ at constant pressure.

5. A sample of gas has a volume of 234.9 L at a temperature of $23^{\circ}C$. What temperature is necessary to have a volume of 200.0 L?

6. A 10.0 liter container of carbon dioxide gas at $300^{\circ}C$ is cooled at constant pressure until it reaches half its original volume. At what Celsius temperature will this sample reach half its original volume?

Gay-Lussac's Law

7. A sample of nitrogen at $75^{\circ}C$ exerts a pressure of 115.6 kPa. What would be the pressure of the nitrogen at $25.0^{\circ}C$?

8. A cylinder of oxygen exerts a pressure of 2.0 atmospheres at $20.0^{\circ}C$. At what temperature will the pressure become 2.5 atmospheres?

9. A soccer ball contains a confined sample of air. The pressure of the air is 1350 torr at $23.0^{\circ}C$. What will be the pressure in the ball at $40.0^{\circ}C$ (a *very* hot afternoon!)?

Chemistry CP

Name: _____

Combined Gas Law Worksheet

Section: _____

Standard Temperature and Pressure (STP): 0°C, 1 atm (or equivalent)

$$K = °C + 273$$

Remember to follow the general strategy:

       List what you know

       Set up the problem

       Estimate and calculate

1. A sample of methane that initially occupies 850. mL at 500. Pa and 500. K is compressed to a volume of 700. mL. To what temperature will the gas need to be cooled to lower the pressure of the gas to 200. Pa?

2. A sample of carbon dioxide gas occupies 45 m^3 at 750 K and 500 kPa. What is the volume of this gas at STP?

3. A sample of gas occupies 75.0 mL at 97 kPa and 18°C. Calculate its volume at 105.2 kPa and 150°C.

4. A helium balloon with a volume of 410. mL is cooled from 27°C to -27°C. The pressure on the gas is reduced from 110. kPa to 25 kPa. What is the final volume of the gas?

5. A balloon of helium occupies 2.30 L at 825 mm Hg and 70°C. What is its volume at STP?

6. An 8.00 L sample of neon gas at 25°C exerts a pressure of 900 kPa. If the gas is compressed to 2.00 L and the temperature is raised to 225°C, what will the new pressure be?