Gas Laws Worksheet - Chapter 1

Boyles Law (Chp 1.2)   **Charles Law (Chp 1.2)**

$P_1V_1 = P_2V_2$ $\dfrac{V1}{T1} = \dfrac{V2}{T2}$

Notes:
1. Temperatures must be in K, where $K = C + 273$

2. Pressures and volumes must be in consistent units.

Boyle's Law
1. A gas has a volume of 300 mL at 300 mm Hg. What will its volume be if the pressure is changed to 500 mm Hg? (180 mL)

2. A gas has a volume of 460 mL at 500 mm Hg. What will be the volume at 1.2 atm?   (252.2 mL)

3. A gas has a volume of 5 liters at 3 atm. To expand the volume to 7500 ml, what the new pressure (in atm) have to be? (2 atm)

4. If I have 5.6 liters of gas in a piston at a pressure of 1.5 atm and compress the gas until its volume is 4.8 L, what will the new pressure inside the piston be?

5. I have added 15 L of air to a balloon at sea level (1.0 atm). If I take the balloon with me to Denver, where the air pressure is 0.85 atm, what will the new volume of the balloon be?

6. I've got a car with an internal volume of 12,000 L. If I drive my car into the river and it implodes, what will be the volume of the gas when the pressure goes from 1.0 atm to 1.4 atm?

Charles' Law
7. A gas has a volume of 4 liters at 50 ^{o}C. What will its volume be (in liters) at 100°C? (4.6 L)

8. A gas has a volume of 350 ml at 45°C. If the volume changes to 400 ml, what is the new temperature? (answer in ^{o}C)   (90.4 ^{o}C)

9. If I have 45 liters of helium in a balloon at 25^{0}C and increase the temperature of the balloon to 55^{0} C, what will the new volume of the balloon be?

10. Calcium carbonate decomposes at 1200^{0} C to form carbon dioxide and calcium oxide. If 25 liters of carbon dioxide are collected at 1200^{0} C, what will the volume of this gas be after it cools to 25^{0} C?

11. I have 130 liters of gas in a piston at a temperature of 250^{0} C. If I cool the gas until the volume decreases to 85 liters, what will temperature of the gas be?