NAME:_____**PER:**___

PRACTICE SHEET:
Boyle's Law, Charles' Law, and Gay-Lussac's Law

TOOLBOX:

Boyles Law

$P_1V_1 = P_2V_2$

Charles Law

$\frac{V_1}{T_1} = \frac{V_2}{T_2}$

Guy-Lussac's Law

$\frac{P_1}{T_1} = \frac{P_2}{T_2}$

Notes:

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

2. Pressures and volumes must be in consistent units.

Complete the following table:

UNKNOWN VARIABLE	EQUATION	KNOWN VARIABLES	GAS LAW
P_1		**V_1, P_1, V_2**	
V_2	**$\frac{V_1}{T_1} = \frac{V_2}{T_2}$**		
P_2	**$P_1V_1 = P_2V_2$**		
P_1			**Gay-Lussac's**
	$\frac{V_1}{T_1} = \frac{V_2}{T_2}$	**V_1, T_1, V_2**	
V_2			**Boyle's**
P_2	**$\frac{P_1}{T_1} = \frac{P_2}{T_2}$**		

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?

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

2. 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?

Charles' Law

4. A gas has a volume of 4 liters at 50 ^{o}C. What will its volume be (in liters) at 100^{o}C?

5. 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 °C)

Guy-Lussac's Law

6. The gases in a hair spray can are at a temperature of 27°C and a pressure of 30 lbs/in^2. If the gases in the can reach a pressure of 90 lbs/in^2, the can will explode. To what temperature must the gases be raised in order for the can to explode? Assume constant volume.

7. Maybelline Cousteau's backup oxygen tank reads 900 mmHg while on her boat, where the temperature is 27°C. When she dives down to the bottom of an unexplored methane lake on a recently-discovered moon of Neptune, the temperature will drop down to –183°C. What will the pressure in her backup tank be at that temperature?