Key.

Gaws Laws: Math 😎

1. Write down the formulas for each Gas Law:

Gas Law	Formula
1. Boyles Law	$P_1V_1 = P_2V_2$
2. Charles Law:	$V_1T_2 = V_2T_1$
3. Ideal Gas Law:	$PV=nRT$ $R=0.0821$
4. Combined Gas Law:	$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$
5. Avogadro's Law:	$V_1n_2 = V_2n_1$
6. Gay Lussac's Law:	$P_1T_2 = P_2T_1$

Ideal

2. Calculate the number of moles of Helium gas you will have at a temperature of 56 degrees °C, a pressure of 3 atm, and a volume of 33.26ml.

$T_1 = 56 + 273 = 329°K$

$P_1 = 3\ atm$

$V = 33.26\ ml \rightarrow L = 0.03326L$

$PV = nRT$

$(3atm)(0.03326L) = n(0.0821)(329K)$

$\frac{0.09978}{27.0109} = n$

$0.00369\ moles = n$

Dalton's / Partial Pressures Law

3. Calculate the partial pressures exerted by a gas mixture of 33 percent O and 67 percent N with a total pressure of 5.63 atm.

33% O_2
67% N_2
$T_{atm} = 5.63 atm$

$5.63 \times .33 = 1.86$ atm O_2
$5.63 \times .67 = 3.77$ atm N_2
$= 5.63$ atm

Boyles

4. A gas sample has an initial volume of 3.25 liters at a pressure of 4 atm. As the pressure increases, the volume decreases to 1.25 liters, what is the final pressure of the gas?

$V_1 = 3.25L$
$P_1 = 4 atm$
$V_2 = 1.25L$
$P_2 = ?$

$P_1V_1 = P_2V_2$
$(4)(3.25) = (x)(1.25L)$
$\frac{(4)(3.25)}{1.25L} = \frac{(x)(1.25L)}{1.25L}$
$10.4 atm = P_2$

Charles Law

5. A car tire currently holds 66.53 liters of gas at a temperature of 56 degrees C, if the temperature increases to 400 degrees Kelvin, what will the resulting ~~pressure~~ volume of the tire be?

$V_1 = 66.53L$

$T_1 = 329K$

$T_2 = 400K$

$V_2 = ?$

$V_1 T_2 = V_2 T_1$

$\frac{(66.53L)(400K)}{329K} = \frac{(x)(329K)}{329K}$

80.89 Liters = V_2

Avogadro's Law

6. At a constant temperature and pressure, 4 moles of a gas sample has an initial volume of 3.56 liters. If you increase the gas to be 8 moles, what will the resulting volume be?

$n_1 = 4 moles$

$V_1 = 3.56 L$

$n_2 = 8 moles$

$V_2 = ?$

$V_1 n_2 = V_2 n_1$

$\frac{(3.56L)(8 moles)}{4 Moles} = \frac{(x)(4 moles)}{4 moles}$

7.12L = X