

# Combined Gas Laws

$$\frac{PV}{T} = \text{constant}$$

(combined gas law)

$$PV = \text{constant} \quad (\text{Boyle's Law})$$

$$\frac{V}{T} = \text{constant} \quad (\text{Charles' Law})$$

$$\frac{P}{T} = \text{constant}$$

ALL gas law problems must be work using absolute temperature, kelvin (K).

## Memory Work:

$$760 \text{ mmHg} = 760 \text{ torr} = 1 \text{ atm} = 1.013 \times 10^5 \text{ Pa}$$

and

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

or

$$P_1 V_1 T_2 = P_2 V_2 T_1$$

and

STP (standard temperature and pressure) – 0 °C and 1 atm  
(273 K) (760 torr)

V – Volume  
T – Temperature  
P – Pressure

} can be variables

amount of gas – constant (always)

P ↑ V ↓ – inversely related } Multiplication of 2 variables = constant (see chart above)

V ↑ T ↑ – directly related } Division of 2 variables = constant (see chart above)

P ↑ T ↑ – directly related } (T must be in Kelvin)