Name _____Mr. Perfect_____ Date ____F09_____

1. A 50.0 mL sample of CO has a pressure of 15.0 psi at 25 °C. If the final volume is 44.0 mL at 25 °C, what is the final pressure in torr? (3 pts)
(*Hint*: 1 atm = 760 mmHg = 101 kPa = 14.696 lb/in^2)

Boyle's Law: $P_1V_1=P_2V_2$ @ constant temperature

Solve for P_2:

$$P_2 = \frac{P_1V_1}{V_2} = 17\ psi$$

1 mmHg = 1 torr

$$17\ psi \times \frac{760\ torr}{14.7\ psi} = 881\ torr$$

2. A 335 mL sample of O_2 at 25 °C is heated to 50 °C. Assuming the pressure remains constant, what is the final volume in mL? (3 pts)

$T_1 = 25 + 273 = 298$ K
$T_2 = 50 + 273 = 323$ K

Charles's Law:

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

Solve for V_2:

$$V_2 = \frac{V_1T_2}{T_1} = \frac{(335\ mL)(323\ K)}{(298\ K)} = 363\ mL$$

3. If 10.0 L of N_2O exerts a pressure of 125 psi at 22 °C, how many moles of this gas are present? (R = 0.0821 L atm/mol K) (4 pts)

Ideal Gas Law: PV = nRT T = 22 + 273 = 295 K

$$125\ psi \times \frac{1\ atm}{14.7\ psi} = 8.50\ atm$$

Solve for n:

$$n = \frac{PV}{RT} = \frac{(8.50\ atm)(10.0\ L)}{\left(0.0821\ \frac{L\ atm}{mol\ K}\right)(295\ K)} = 3.51\ mol$$