Chemistry **Name**
Period _____

Gas Law Stoichiometry Worksheet

Directions: Use significant figures and units in the problems below.

1. Given the following unbalanced chemical equation for the combination reaction of sodium metal and chlorine gas:

   ___$Na_{(s)}$ + ___ $Cl_{2(g)}$ ⟶ ___$NaCl_{(s)}$

   a. What volume of chlorine gas, measured at STP, is necessary for the complete reaction of 4.81 g of sodium metal.

2. ___$C_3H_{8(g)}$ + ___$O_{2(g)}$ ⟶ ___$CO_{2(g)}$ + ___$H_2O_{(g)}$

   a. Balance the above reaction.
   b. What volume of oxygen gas at 25˚C and 1.04 atm is needed for the complete combustion of 5.53 g of propane?

3. Potassium permanganate, $KMnO_4$, is produced commercially by oxidizing aqueous potassium manganate, K_2MnO_4.

   ___ $K_2MnO_{4\ (g)}$ + ___$Cl_{2(g)}$ ⟶ ___ $KMnO_{4\ (g)}$ + ___$KCl_{(g}$

   a. Balance the above reaction.
   b. What volume of $Cl_2(g)$, measured at STP, is needed to produce 10.0 g of $KMnO_4$?

4. If water is added to magnesium nitride, ammonia gas is produced when the mixture is heated.

   ___$Mg_3N_{2(g)}$ + ___ $H_2O_{(g)}$ ⟶ ___$MgO_{(g)}$ + ___$NH_{3(g)}$

   a. Balance the above reaction.
   b. If 10.3 g of magnesium nitride is treated with 10.3 g of water, what volume of ammonia gas would be collected at 24˚C and 752 mmHg?