AP Exam Review- Gases Name: _____ Period: ____

(1) A hydrogen gas sample is collected over water. The volume of the sample was 190.0 mL at 26°C, and the pressure in the room was 754 mm Hg. The vapor pressure of water at 26°C is 25.2 mm Hg.

a. Calculate the number of moles of hydrogen in the sample.
b. Calculate how many molecules of water vapor are present in the sample.
c. Determine the density (in g/L) of the gas mixture.
d. Determine the mole fraction of water.

(2) A sample containing 2/3 mole of potassium chlorate, $KClO_3$, is heated until it decomposes to potassium chloride and oxygen gas. The oxygen is collected in an inverted bottle through the displacement of water. Answer the following questions using this information.

a. Write a balanced chemical equation for the reaction.
b. How many moles of oxygen gas are produced?
c. The temperature and pressure of the sample are adjusted to STP. The volume of the sample is found to be slightly greater than 22.4 liters. Explain.
d. An excess of sulfur is burned in the oxygen. Write a balanced chemical equation and calculate the number of moles of gas formed.
e. After the sulfur had completely reacted, a sample of the residual water was removed from the bottle and found to be acidic. Explain.