Dalton's Law Practice Problems

1) Three flasks are connected to each other, separated only by a three-way stopcock.
   - Flask 1 has a volume of 3.000 liters and holds helium gas at a pressure of 3.500 atmospheres
   - Flask 2 has a volume of 2.000 liters and holds nitrogen gas at a pressure of 2.000 atmospheres
   - Flask 3 has a volume of 1.800 liters and holds oxygen gas at a pressure of 4.000 atmospheres

   If the stopcock separating the flasks were to be opened, what would the partial pressure of each gas in the apparatus be?

2) What would the total pressure in the apparatus be?

3) What would the mole fraction of oxygen be inside the apparatus after the stopcock was opened?

4) If liquid water is added to the mixture, what will the mole fraction of each of the gases in the mixture be? The vapor pressure of water at 25^0 C is 0.031 atm.

Ideal Gas Law Problems

Use the ideal gas law to solve the following problems:

1)   If I have 4 moles of a gas at a pressure of 5.6 atm and a volume of 12 liters, what is the temperature?

2)   If I have an unknown quantity of gas at a pressure of 1.2 atm, a volume of 31 liters, and a temperature of 87 ^{0}C, how many moles of gas do I have?

3)   If I contain 3 moles of gas in a container with a volume of 60 liters and at a temperature of 400 K, what is the pressure inside the container?

4)   If I have 7.7 moles of gas at a pressure of 0.09 atm and at a temperature of 56 ^{0}C, what is the volume of the container that the gas is in?

5)   If I have 17 moles of gas at a temperature of 67 ^{0}C, and a volume of 88.89 liters, what is the pressure of the gas?

6)   If I have an unknown quantity of gas at a pressure of 0.5 atm, a volume of 25 liters, and a temperature of 300 K, how many moles of gas do I have?