Name:

Period:

**Ideal Gas Laws Homework**

1. *Review*: 1 atm = \_\_\_\_ mmHg 1 atm = \_\_\_\_ psi 1L = \_\_\_\_mL 1L = \_\_\_\_cm3 oC + \_\_\_\_ = K
2. **Fill in the blanks**: Ideal Gas Formula: \_\_\_ \_\_\_ = \_\_\_ \_\_\_ \_\_\_. R = \_\_\_\_\_\_\_. In order for R to equal this amount, Pressure MUST be measured in \_\_\_\_\_\_\_\_\_, Volume MUST be measured in \_\_\_\_\_\_\_, Temperature MUST be measured in \_\_\_\_\_\_\_\_\_ and n MUST be measured in \_\_\_\_\_\_\_.
3. The following units of Pressure, Temperature, Volume and n are all not in the correct form. Correct them using Stoichiometry (T-Charts):
   1. 690 mmHg is a unit of \_\_\_\_\_\_\_\_\_\_. Convert to \_\_\_\_\_. **SHOW WORK**:
   2. 3000 mL is a unit of \_\_\_\_\_\_\_\_\_\_\_\_. Convert to \_\_\_\_\_\_. **SHOW WORK**:
   3. 45 psi is a unit of \_\_\_\_\_\_\_\_\_\_\_\_. Convert to \_\_\_\_\_\_. **SHOW WORK**:
   4. 27oC is a unit of \_\_\_\_\_\_\_\_\_\_\_\_\_. Convert to \_\_\_\_\_\_. **SHOW WORK**:
   5. 2500 cm3 is a unit of \_\_\_\_\_\_\_\_\_. Convert to \_\_\_\_\_\_\_. **SHOW WORK**:
4. Given each of the following sets of values, FIND THE MISSING ONE.
   1. P = 3atm V = \_\_\_\_\_ L n = 0.210 mol T = 300 K
   2. P = .50 atm V = 11.2 L n = \_\_\_\_ mol T = 50 K
   3. P = \_\_\_\_ atm V = 5.3 L n = 3.5 mol T = 600 K
5. Given each of the following sets of values, FIND THE MISSING ONE. (*NOTE: ONE OF THE VALUES WILL NOT BE IN THE CORRECT FORM.* ***UNDERLINE AND CHANGE IT USING T-CHARTS***).
   1. P = 782 mmHg V = \_\_\_\_\_\_L n = .401 mol T = 400 K
   2. P = 30 atm V = 100 mL n = 8.3 mol T = 25 K
   3. P = \_\_\_\_ atm V = 4.0L n = 9.4 mol T = 39oC
6. At what temperature does 16.3 mol of N2 gas have a pressure of 1.25atm in a 25.0L tank?
7. What volume does 4.24 grams of N2 gas occupy at 58oC and 2.04 atm?
8. **CHALLENGE PROBLEM**: A 125mL flask contains argon at 1.30atm and 77oC. What amount of Ar is present (in grams)?
9. **CHALLENGE PROBLEM**: 35.5 grams of Xenon (Xe) exerts a pressure of .255atm at -45oC. What volume is this xenon being stored in?
10. **CHALLENGE PROBLEM**: An outdoor storage vessel for helium gas with a volume of 300cm3 is at 1.5 atm and 10oC at 2:00am. An hour later, the temperature has risen to 30oC.
    1. Using Gay-Laussec’s Law (P1T2 = P2T1), find the new pressure of the gas (P2).
    2. Convert the new temperature (30oC) into Kelvins and the volume into Liters.
    3. Using the Ideal Gas Law, find out how much gas (in moles) the storage vessel contains.
    4. How much helium gas is stored in this vessel (in grams)?
11. *Review*: What is a **directly proportional** relationship? Use two of the three factors in gas laws (pressure, volume, temperature) in your answer. How does it look on a graph?
12. *Review*: What is an **inversely proportional** relationship? Use two of the three factors in gas laws (pressure, volume, temperature) in your answer. How does it look on a graph?