

# Chapter 14 – Quiz #5

Solve the following problems on your own paper.

## Remember the following KEY POINTS:

- **Make sure all temperature units in any gas law use the Kelvin scale.**
- **Isolate the unknown on one side of the equation BEFORE you plug in your numbers.**
- **Include units with all numbers!**
- **Put a box around your final answer. Don't forget about SF!**
- **SHOW ALL WORK!**

1. A balloon is inflated in a room at 27°C and has an initial volume of 3.00 liters. Then, the balloon is heated to a temperature of 66°C. What is its new volume in liters if the atmospheric pressure is held constant? What is the name of the gas law you will use?
2. A gas with a volume of 2.5 liters at a pressure of 159 kPa expands to a volume of 15.2 liters. What is the pressure in the container if the temperature is held constant? What is the name of the gas law you will use?
3. As the temperature in a pressure cooker rose from 303 K to 401 K, the pressure rose to 1.36 atmospheres. What was the original pressure in the cooker, assuming that the volume remained constant? What is the name of the gas law you will use?
4. What volume of gas is present at 388 K and 2.15 atmospheres if the same sample of gas initially occupied 0.51 L at 261 K and 4.03 atmospheres? What is the name of the gas law you will use?
5. A sample of gas is found to occupy 2.950 L at 26.0 °C and 750.0 mm Hg. How many moles of the gas are present? What is the name of the gas law you will use?  
1 atm = 760 mm Hg  
 $R = 0.08206 \text{ L} \cdot \text{atm} / \text{mol} \cdot \text{K}$
6. In a reaction between nitrogen and hydrogen to produce ammonia (NH<sub>3</sub>), what volume of hydrogen is needed to produce 15 L of ammonia (assuming constant temperature and pressure)?
7. In the same reaction in #6 above, if 2.00 L of nitrogen completely reacts at 1.00 atm and 25 °C, how many grams of ammonia are produced?  
 $R = 0.08206 \text{ L} \cdot \text{atm} / \text{mol} \cdot \text{K}$

