**Answers for “Special Gas Law Problems For A Special Class”**

If you weren’t in class to get the answers, or if you were in my 7th period and couldn’t get the answers, here are the answers (as well as some other information) you might find useful:

1. Neither moles nor grams are discussed, so this is a combined gas law problem. P1 = 45 atm, V1 = 18 L, P2 is the unknown, and V2 is 2.5 L. (Note: Temperature isn’t mentioned at all, so we just skip it entirely when solving this problem). Putting it into the combined gas law, we find that the pressure should be 324 atm.
2. Since moles are mentioned, we know that we need to use the ideal gas law. P is what we’re solving for, V = 5.0 L, n = 7.5 mol, R = 0.08206 Latm/mol K, and T =298 K (Note: You always need to convert temperature to Kelvin by adding 273). Solving for pressure, we find that P = 36.7 atm.
3. We’ve got grams, so we’ve got the ideal gas law. P = 1.25 atm, V is what we’re solving for, n = 0.89 moles (you find this by dividing the number of grams of nitrogen, 25 g, by the molar mass of nitrogen, 28 g), R = 0.08206 Latm/mol K, and T = 305 K. Solving for V, we find it’s 17.8 L.
4. No moles or grams = combined gas law. Pressure isn’t mentioned, so we ignore it. However, V1 is 150 L, T1 is 298 K, V2 is what we’re solving for, and T2 = 288 K. Solving for V2, we get an answer of 145 L.
5. We see moles in the problem, so we use the ideal gas law. P = 1.15 atm, V = 550 L, n is what we’re solving for, R = 0.08206 Latm/mol K, and T =298 K. Solving for n, we get 25.9 mol.
6. No moles or grams = combined gas law. Pressure isn’t mentioned at all, so we ignore it. V1 = 50 L, T1 = 308 K, V2 is our unknown, and T2 is 238 K. Solving for V2, we get 38.6 L.
7. If you thought about an ideal gas, then yet, it would become zero. If you thought about a real gas, you’d find that either 1) The gas would only compress so far before the space between the molecules was zero, or 2) The gas would condense into a liquid or solid before then (which is what would happen). On a quiz, I’d ask you to explain your answer to determine what conditions you were thinking of.

7- I actually have two number 7’s, one on the front and one on the back page. This answer is for the second one: According to KMT, kinetic energy is proportional to temperature in K – if you used degrees Celsius, you’d find the energy would be negative below the freezing point of water.

1. There’s a lot of space between molecules.
2. Yes. At some point you’d either squish the molecules so tightly that there was no space between them, or you’d compress the gas into a liquid or solid.
3. The one in a balloon. The gas in an unpressurized balloon would have more space between the gas molecules.
4. The first one (1.06 atm vs. 0.96 atm). I’ll leave the work to you so you can figure out how to solve it without my help.
5. Temperature = 484 K. Again, I’ll leave the work to you so you can figure it out how to solve it without my assistance.