NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ DATE DUE: \_\_\_\_\_\_\_\_\_\_\_\_

TEACHER: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**/26**

**Year 11 Term 1– Gases HOMEWORK SHEET No. 1**

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|  | **1. List the key points of the Kinetic Molecular Theory (KMT) of gases**. NOTE: Your answer should be succinct and focus on the key point, not be repeated verbatim from notes. |
| /5 |  |
| /4 | **2. Use your knowledge of the KMT to explain the following scenario**.  **Scaffold** – firstly list the relevant key points of the KMT. Secondly use these points to explain how an increase in temp causes the volume of the balloon to increase.  “*An inflated balloon, left in a locked car on a hot day, will expand and possibly explode*.” |
| /1 | **3. Convert the following temperatures to K**.  a) 104 0C  b) -31 0C |
| /1 | **4. The Australian National Weather Service routinely supplies atmospheric pressure data to help pilots set their altimeters. The units the ANWS uses for atmospheric pressure are mm of mercury. A barometric pressure of 775 mm of mercury corresponds to \_\_\_\_\_\_\_\_\_\_ kPa**.  A) 1.020 B) 77.50 C) 775 D) 103.3 E) 16.01 |

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| /3 | **5. Convert the following values to the units indicated in the brackets.**  **a)** 15 345 kPa (to atmospheres)  **b)**  77 K –boiling point of Nitrogen gas, our atmosphere is 80% N2 (to 0C)  **c)** 1.07 atm (to kPa)  **d)** 231 m3 (to L)  **e)** 923 mL (to L)  **f)**  0.75 L (to m3) |
| /2 | **6. a) State in one sentence the relationship expressed in the Boyle’s law equation.**  **b) Boyle’s law is valid only for situations in which assumptions are made about certain conditions. What are these assumptions?** |
| /2 | **7. A sample of nitrogen gas 1 has a volume of 478 cm3 and a pressure of 104.1 kPa. What volume would the gas occupy at 88.2 kPa if the temperature remains constant?** |
| /3 | **8. Divers get “the bends” if they come up too fast because gas in their blood expands, forming bubbles in their blood. If a diver has a 0.0015 mL bubble of gas in his blood at a pressure of 35 atm (~35 m deep), but then rises instantaneously to a depth (~1 m) where he experiences a pressure of 1.1 atm, what will the volume of gas in his blood be? What is the percent increase in the size of the bubble?** |
| /2 | **9. A sample of gas is transferred from a 75 mL vessel to a 500.0 mL vessel. If the initial pressure of the gas is 145 atm and if the temperature is held constant, what is the pressure of the gas sample in the 500.0 mL vessel?** |
| /1 | **10. State the S.I. units of pressure, volume, and temperature** |
| /2 | **11. (a) The following question should not be accurately solved using Boyle’s Law. Explain why.**  **“*a balloon which was inflated and tied off had a volume of 2.6 L at the room pressure of 108.3 kPa. When placed in a cold refrigerator which had a pressure of only 981.2 kPa, the balloons’ volume decreased to?***  **(b) In question 8, the temp of the water would surely vary according to depth. Is it valid to use Boyle’s law to calculate an answer to Q8? Explain.** |