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

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

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**Year 11 Term 1 – Chemistry**

**HOMEWORK SHEET No. 5 – Gases**

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| /5 | **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.*

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| /4 | **2. Use your knowledge of the KMT to explain the following scenario**. “*An inflated balloon, left in a locked car on a hot day, will expand and possibly explode*.”**Scaffold** – firstly identify 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. |
| /1 | **3. Write two mathematical formulas which describes the idea gas law.**   |
| /1 | **4. What is the value of, and what are the units for, the universal gas constant, R** |
| /3 | **5. Convert the following values to the units indicated in the brackets** **a)** 1023 mmHg (to kPa) **d)** 0.36 cm3 (to L)**b)**  450 0C (to K) **e)** 32 m3 (toL)**c)** 0.05 atm (to kpa)  **f)**  0.013 mL (to L)  |
| /2 | **6. The Gas in a balloon occupies 3.3 L. What volume will it occupy if the pressure is changed from 100 kPa to 90 kPa at a constant temperature of 310 K.** |
| /2 | **7. A 7.50 litre sealed jar at 18 °C contains 0.125 moles of oxygen and 0.125 moles of nitrogen gas. What is the pressure in the container?** |
| /2 | **8. A 500 mL metal cylinder holding 0.5 grams of helium gas is known to rupture at a pressure of 10 atmospheres. At what temperature, in °C, will the container fail?** |
| /3 | **9. A 60.0 L tank of chlorine gas at 27 °C and 125 atm springs a leak. When the leak was discovered, the pressure was reduced to 50 atm although the temperature had not changed. How many moles of chlorine gas escaped?** |
| /3 | **10.** [**If you burned 100 grams of octane (petrol) (C8H18), how many litres of carbon dioxide would be produced at a temperature of 350.0°C and a pressure of 1.00 atm?**](https://socratic.org/questions/2-c8h18-l-25-o2-g-16-co2-g-18-h2o-g-if-you-burned-one-gallon-of-gas-c8h18-approx) (hint: equation is not balanced)**C8H18(l) + O2(g) → CO2(g) + H2O(g)** |
| /4 | **11. (a) On the following graph sketch the line you would expect an ideal gas to conform to.****(b) Explain your reasoning**Temperature (K)$$\frac{PV}{n}$$**https://cnx.org/resources/c94ad9ca5a719c6548b712c2f5f8c729fa8fe44d/CNX_Chem_09_02_Exercise25_img.jpg****c) identify which of the graphs on the right are consistent with the mathematical relationships in the ideal gas law.**  |