Friday Worksheet   **Name: ……………….**
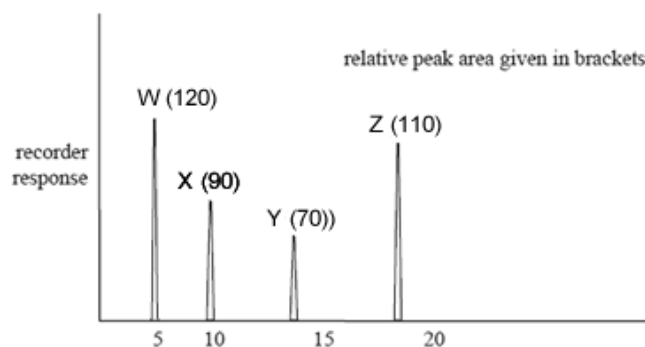**Chromatography 3**

1) A mixture of two compounds, 2-chloro-2-methylpropane and 2-chloro-2-methylbutane were was analysed using gas chromatography. The chromatogram of this mixture produced the results below.

Compound	amount	Peak area
2-chloro-2-methylpropane	1.51×10^{-3} mol	450
2-chloro-2-methylbutane	4.52×10^{-3} mol	1300

   a) Which molecule would you expect to have the shortest retention time in the chromatography column? Explain your answer

   b) In another experiment, 0.501×10^{-3} mol of 2-chloro-2-methylpropane was analysed in a different mixture under the same conditions.
   What would be the expected peak area on the chromatogram associated with this amount of 2-chloro-2-methylpropane?

2) The diagram on the right shows the gas chromatogram of a sample containing four straight chain alkanes The following statements refer to this chromatogram.

relative peak area given in brackets

I) The boiling points of the compounds arranged from highest to lowest are
Z > Y > X > W.
II)The retention times will stay the same if the temperature at which the chromatogram is recorded is increased, all other conditions remaining constant.
III) Hydrogen gas could have been used as a carrier gas to obtain this chromatogram.

For each statement, discuss if it is true or false and give a reason.

3) A High-performance liquid chromatography (HPLC) column uses a non-polar stationary phase together with a polar mobile phase.
Which of the molecules, 2-chloro-2-methylpropane or 2-chloro-2-methylbutane , will have the greatest retention time on the column? Explain