## IB Chem: Data & Graphing worksheet

## Name:

Oxygen can be generated by the reaction of Hydrogen Peroxide with Manganese Dioxide.

$$2H_2O_2 + MnO_2 \rightarrow 2H_2O + Mn + 2O_2$$

A chemistry class sets up nine test tubes and places different masses of  $MnO_2$  in each test tube. An equal amount of  $H_2O_2$  is added to each test tube and the volume of gas produced is measured each minute for five minutes. The data from the experiment is:

Tube #	$\frac{MnO_2(g)}{\pm 0.1g}$	$1 \min (mL O_2 \\ \pm 0.1mL)$	$2 \min (mL O_2 \\ \pm 0.1mL)$	$\begin{array}{r} 3 \min \left( \text{mL O}_2 \right. \\ \underline{+} 0.1 \text{mL} \right) \end{array}$	$\frac{4 \min (mL O_2}{\pm 0.1 mL})$	$5 \min (mL O_2 \\ \pm 0.1mL)$	
1	0.1	1.4	2.6	3.5	4.2	5.1	
2	0.2	2.8	4.6	5.8	7.1	7.6	
3	0.3	4.9	7.2	8.8	10.2	11.3	
4	0.5	5.9	8.5	10.4	11.8	13.3	
5	1.0	8.5	12.4	14.4	16.1	17.1	
6	1.5	11.0	14.8	17.5	19.8	21.8	
7	2.0	12.0	17.0	20.2	22.7	24.8	
8	2.5	13.6	19.0	22.1	24.7	27.3	
9	3.0	16.2	21.8	25.1	28.2	30.4	

a) What volume of  $O_2$  did tube #3 produce between the second and fourth minutes?

b) How much  $O_2$  is produced in tube #5 during the first two minutes?

c) How much oxygen did tubes 7 and 8 produce together during the third minute?

d) What volume of oxygen gas, in liters, was produced during this procedure?

e) Graph the amount of oxygen produced each minute in test tubes # 2, 4, and 6.

- f) By comparing the slope of the graph curves, which tube was producing oxygen at the fastest rate between minutes four and five?
- g) Make a graph using the mass of manganese dioxide and the volume of oxygen for all tubes at five minutes.

2. The data in the table shows the age (in years) and the corresponding mean height (in inches) for a group of males ages 2 to 19.

Age (years)	2	3	6	8	10	12	14	15	17	18	19
Height (in) <u>+</u> 1in	28	33	40	46	52	55	61	64	70	72	72

a) Construct a graph from the data in this question. Be sure to properly label your graph (title, axes, measurements, etc.)

b) Include a trend line showing the equation of the line and the correlation

c) From the trend line find the expected mean height of males at the age of 13

d) If the data was extended from 19 to 25 years of age what would the data look like? How would the line of "best-fits" change is a trend line included ages 2 – 25?