MHF 4UI   Learning Goals Unit 3 – Rates of Change

- **determine and interpret an "Average Rates of Change"**
- **determine and interpret an "Instantaneous Rate of Change"**
- **analyse and interpret rates of change graphically.**
- **determine the slope and equation of the tangent to a "general function", f(x)**

Knowledge and Skills	I have reviewed it.	I have done a question.
1) Position / Amount Ex. $d(6) = ?$		
2) Average Rate Of Change $= \dfrac{\Delta y}{\Delta x}$		
3) Instantaneous Rate of Change $=$ slope of secant PQ as Q→P For non-polynomials: $\underline{P(x, y)}$ $\underline{Q(x + h, y)}$ Slope of Secant PQ (choose 3 points below, 1 above)		
For polynomials: **Instantaneous Rate of Change** $= \lim\limits_{h \to 0} \dfrac{f(x+h) - f(x)}{h}$		
For a "general function", f(x) **slope of the tangent** $=$ slope of the secant PQ as Q→P OR **slope of the tangent** $= \lim\limits_{h \to 0} \dfrac{f(x+h) - f(x)}{h}$		
Proper Rate of Change Final Statement: (a) Velocity questions - since velocity is a special rate which describes the change in distance versus change in time we generally state: ∴ the velocity is <u>positive value</u> <u>correct units</u> <u>direction</u> Ex. ∴ the velocity is <u>62.5</u> <u>kilometres per hour</u> <u>left</u> (b) For other rate questions we generally state: ∴ the <u>thing that's changing</u> is (**increasing** or **decreasing**) at <u>positive value</u> <u>correct units</u> Ex. The <u>mass</u> is **decreasing** at <u>5.77</u> <u>milligrams per minute</u>.		
Find equation of the tangent to *f(x)* at x =		
"Story Graphs" (Hot Wheels)		
– interpret a graph		
– create a graph		