1.3 Basic Differentiation

	At the end of this outcome I should...	I can do	Revised
1.3.1	know the terms: limit, differentiation at a point, differentiation, derivative, differentiation over an interval, derived function	❑	❑
1.3.2	use notation $f'(x)$ and $\frac{dy}{dx}$ for a derivative	❑	❑
1.3.3	know that $f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$	❑	❑
1.3.4	know that if $f(x) = x^n$, then $f'(x) = nx^{n-1}$, $n \in \boldsymbol{Q}$ (set of rational numbers) if $f(x) = g(x) + h(x)$, then $f'(x) = g'(a) + h'(x)$ if $f(x) = kg(x)$, then $f'(x) = kg'(x)$	❑	❑
1.3.5	know meaning of rate of change, average gradient, increasing/decreasing, stationary point (value), max/min turning point (value), point of inflexion	❑	❑
1.3.6	know that $f'(a)$ is the rate of change of f at a	❑	❑
1.3.7	know that $f'(a)$ is gradient of tangent at $x = a$	❑	❑
1.1.8	know that gradient of curve equals gradient of tangent at that point	❑	❑
1.3.9	find gradient of tangent to the curve $y = f(x)$ at $x = a$	❑	❑
1.3.10	find points on a curve where gradient has a particular value	❑	❑
1.3.11	know and apply the fact that if $f'(x) > 0$ …….function is increasing if $f'(x) > 0$ …….function is decreasing if $f'(a) = 0$ then the function has a stationary value at $x = a$	❑	❑
1.3.12	find the stationary point(s) on a curve and determine their nature	❑	❑
1.3.13	sketch the curve by finding the stationary point(s), nature, intersection with axes, behaviour of y for large +ve/-ve x	❑	❑
1.3.14	determine the greatest/least values of a function in a given interval	❑	❑
1.3.15	solve optimisation problems **using calculus**	❑	❑

N.B. **Bold** type indicates Level A/B content.