Topics	What students need to learn:		
		Content	Guidance
7 **Differentiation**	7.1	Understand and use the derivative of $f(x)$ as the gradient of the tangent to the graph of $y = f(x)$ at a general point (x, y); the gradient of the tangent as a limit; interpretation as a rate of change	Know that $\frac{dy}{dx}$ is the rate of change of y with respect to x. Knowledge of the chain rule is not required. The notation $f'(x)$ may be used for the first derivative and $f''(x)$ may be used for the second derivative.
		sketching the gradient function for a given curve	Given for example the graph of $y = f(x)$, sketch the graph of $y = f'(x)$ using given axes and scale. This could relate speed and acceleration for example.
		second derivatives	
		differentiation from first principles for small positive integer powers of x	For example, students should be able to use, for $n = 2$ and $n = 3$, the gradient expression $$\lim_{h \to 0}\left(\frac{(x+h)^n - x^n}{h}\right)$$ Students may use δx or h
		Understand and use the second derivative as the rate of change of gradient.	Use the condition $f''(x) > 0$ implies a minimum and $f''(x) < 0$ implies a maximum for points where $f'(x) = 0$
	7.2	Differentiate x^n, for rational values of n, and related constant multiples, sums and differences.	For example, the ability to differentiate expressions such as $(2x + 5)(x - 1)$ and $\frac{x^2 + 3x - 5}{4x^{\frac{1}{2}}}$, $x > 0$, is expected.
	7.3	Apply differentiation to find gradients, tangents and normals,	Use of differentiation to find equations of tangents and normals at specific points on a curve.
		maxima and minima and stationary points.	To include applications to curve sketching. Maxima and minima problems may be set in the context of a practical problem.
		Identify where functions are increasing or decreasing.	To include applications to curve sketching.

Topics	What students need to learn:		
	Content		**Guidance**
8 **Integration**	8.1	Know and use the Fundamental Theorem of Calculus.	Integration as the reverse process of differentiation. Students should know that for indefinite integrals a constant of integration is required.
	8.2	Integrate x^n (excluding $n = -1$) and related sums, differences and constant multiples.	For example, the ability to integrate expressions such as $\frac{1}{2}x^2 - 3x^{-\frac{1}{2}}$ and $\frac{(x+2)^2}{x^{\frac{1}{2}}}$ is expected. Given $\mathrm{f}'(x)$ and a point on the curve, Students should be able to find an equation of the curve in the form $y = \mathrm{f}(x)$.
	8.3	Evaluate definite integrals; use a definite integral to find the area under a curve.	Students will be expected to understand the implication of a negative answer.