

Question	Answer	Marks	AO	Guidance	
6	$(x+h)^3 = x^3 + 3x^2h + 3xh^2 + h^3$	B1	1.1	Correct expansion of $(x+h)^3$	Seen at any point Must have numerical coefficients not 3C_1 Condone 1 as a coefficient Could use δx or instead of h Allow unsimplified ie like terms not collected
	$\begin{aligned} f(x+h) - f(x) &= \\ \{2(x+h)^3 + 3(x+h)\} - \{2x^3 + 3x\} \\ &= 2(x^3 + 3x^2h + 3xh^2 + h^3) + 3(x+h) \\ &\quad - 2x^3 - 3x \end{aligned}$	M1	2.1	Attempt to simplify $f(x+h) - f(x)$	If considering $2x^3$ and $3x$ separately then both must be considered for the M1 Could follow B0 but $f(x+h)$ must be a 4 term cubic Allow BOD for $\dots - 2x^3 + 3x$
	$= 6x^2h + 6xh^2 + 2h^3 + 3h$	A1	2.1	Correct 4 term expression for $f(x+h) - f(x)$ www	Either one expression or two separate expressions
	$\frac{f(x+h) - f(x)}{h} = \frac{6x^2h + 6xh^2 + 2h^3 + 3h}{h}$	M1	2.5	Attempt $\frac{f(x+h) - f(x)}{h}$	f must be in terms of the given function and not just a statement of the general definition $f(x+h)$ does not need to be expanded Allow even if $f(x+h)$ is now incorrect If considering $2x^3$ and $3x$ separately then both must be considered for the M1 Allow BOD for $\dots - 2x^3 + 3x$
	$6x^2 + 6xh + 2h^2 + 3$ $f'(x) = \lim_{h \rightarrow 0} (6x^2 + 6xh + 2h^2 + 3)$ $= 6x^2 + 3$	A1	1.1	Obtain correct expression www	Must see 'lim', ' $h \rightarrow 0$ ', and $f'(x)$ Dep on previous 5 marks being awarded NB Starting with $6x^2 + 3$ will get no credit in the entire question as not $f(x)$

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