

Q	Marking instructions	AO	Marks	Typical solution
8	Differentiates with at least one term correct	1.1a	M1	$\frac{dy}{dx} = 3x^2 - 10x - 8$ $\text{For stationary point } \frac{dy}{dx} = 0$ $3x^2 - 10x - 8 = 0$ $x = -\frac{2}{3} \text{ or } x = 4$ $\frac{d^2y}{dx^2} = 6x - 10$ $\text{When } x = -\frac{2}{3}, \frac{d^2y}{dx^2} = -14, \text{ maximum}$ $\text{When } x = 4, \frac{d^2y}{dx^2} = 14, \text{ minimum}$ $\text{When } x = 4, y = -46$ $\text{Minimum is } (4, -46)$
	Obtains correct derivative	1.1b	A1	
	Explains that $\frac{dy}{dx} = 0$ for stationary point OE	2.4	E1	
	Sets their derivative = 0 and solves to find at least one real value for x PI by both correct values of x	1.1a	M1	
	Obtains $x = -\frac{2}{3}$ and $x = 4$	1.1b	A1	
	Substitutes at least one of their values of x to obtain a y value PI by -46 or $\frac{130}{27}$ Must have obtained M1 M1	1.1a	M1	
	Differentiates a second time using their $\frac{dy}{dx}$ and tests at least one of the x coordinates of their turning points Or Evaluates the gradient either side of at least one of their x value Or Justifies fully from shape of cubic with reference to a sketch or using the nature of a positive cubic graph	3.1a	M1	
	Completes a reasoned argument to justify the minimum point at $(4, -46)$ Can obtain R1 without the E1 Must see derivative = 0 for R1 Must test both x values for R1 CSO	2.1	R1	
Question 8 Total			8	