Question			Answer	Marks	AOs	Guidance	
12	(a)		$\frac{dy}{dx}=2x-2x^{-3}$	M1	3.1a	Attempt to differentiate	
			At $\left(2,\frac{17}{4}\right)$ gradient $=2\times2-2\times2^{-3}=\frac{15}{4}$	A1	1.1	Correct value in any form	
			Equation of the tangent $y-\frac{17}{4}=\frac{15}{4}(x-2)$ $y=\frac{15}{4}x-\frac{13}{4}$	M1	3.1a	Using their gradient to find the equation of the tangent	
			Crosses x-axis when $y=0$, $x=\frac{13}{15}$	A1	1.1	Allow 0.867 or better	
			Crosses y-axis when $x=0$, $y=-\frac{13}{4}$	A1	1.1	any form	
			Area of triangle $\frac{1}{2}\times\frac{13}{15}\times\frac{13}{4}=\frac{169}{120}$ [below the axis]	A1 [6]	1.1	FT their values but must be exact. Accept positive or negative value	Note Area 1.41 gets 5/6 marks
12	(b)		At a stationary point $\frac{dy}{dx}=2x-2x^{-3}=0$	M1	1.1a	Equating their derivative to zero and attempting to solve	
			$x^4=1$ giving $x=\pm1$ so there are only two stationary points	A1	1.1	Finding both roots and no others	
			$\frac{d^2y}{dx^2}=2+6x^{-4}$	M1	1.1a	Differentiating their $\frac{dy}{dx}$	Allow for evaluating gradient at appropriate points either side. Arguing point is minimum from their gradients [incl sketch]
			When $x=1$, $\frac{d^2y}{dx^2}=2+6\times1^4[=8]>0$ so minimum point	M1	2.1	Evaluating at (at least one of) their stationary point(s)	
			When $x=-1$, $\frac{d^2y}{dx^2}=2+6\times(-1)^4[=8]>0$ so also minimum point	A1	2.1	Argues that both points are minimum from correct working. Allow arguing that second derivative is positive everywhere or a symmetry argument	
			The two stationary points are both minimum points so there is no maximum point.	E1 [6]	2.2a	Deduces that there are no maximum points.	