

Q	Marking instructions	AO	Marks	Typical solution
8	Rewrites $\frac{18}{x}$ as $18x^{-1}$ PI by correct differentiation.	1.2	B1	$y = x^3 + 15x - 18x^{-1}$
	Differentiates, at least one term correct ACF	3.1a	M1	$\frac{dy}{dx} = 3x^2 + 15 + \frac{18}{x^2}$
	Obtains $\frac{dy}{dx} = 3x^2 + 15 + \frac{18}{x^2}$	1.1b	A1	For stationary point $3x^2 + 15 + \frac{18}{x^2} = 0$ $3x^4 + 15x^2 + 18 = 0$ $x^4 + 5x^2 + 6 = 0$ $(x^2 + 2)(x^2 + 3) = 0$ $x^2 = -2$ or $x^2 = -3$ No real solutions for x No stationary points
	Equates their derivative to 0 and solves for x^2 or x Or Uses $x^2 > 0$	1.1a	B1F	
	Deduces from correct working that there are no stationary points with a reason such as: Cannot square root negative values (of x) OE Or solutions for x are imaginary/not real Or shows that quartic > 0 Or shows that $\frac{dy}{dx} > 0$ Do not accept cannot be solved/cannot factorise Can score B1 M1 A1 B0 E1	2.2a	E1	
Question 8 Total			5	