Question			Answer	Marks	AO	Guidance	
3	(a)	(i)	$f(x) = x^3 + px + q \Rightarrow f'(x) = 3x^2 + p$	M1	1.1	Attempt at differentiating f(x) with at least one non-zero term correct	**M0** for $f'(x) = x^2 + p + \frac{q}{x}$
			$f'(2) = 13 \Rightarrow p = 1$	A1	1.1	Correct value for p	
				[2]			
3	(a)	(ii)	$2^3 + 2p + q = 0$	M1	1.1a	Substituting x = 2 into f(x) and equating to 0 **or** for correctly re-writing as $(x-2)(x^2+2x+4+p)$ (with p or their value of p from **(a)(i)**)	Could be in terms of q only e.g., $2^3 + 2 \times their(p) + q = 0$ Possibly seen in an attempt at long division
			$q = -10$	A1	1.1	Correct value for q	
				[2]			
3	(b)		$y = (x-2)^3 + p(x-2) + q - 3$	B1 B1	1.1 1.1	Substituting (x ± 2) into both x terms of y = f(x) Subtracting 3 (oe) at some stage	Allow with p and q or with incorrect values of p and/or q – **note that using 2 vertically and/or 3 horizontally cannot be treated as a MR**
			$y = x^3 + 3x^2(-2) + 3x(-2)^2 + (-2)^3$ $+ px - 2p + q - 3$	M1	1.1	Correct expansion of (x ± 2)^3. Can be unsimplified for **M1**. If correct bracketing not seen then must be implied by later working	
			$y = (x^3 - 6x^2 + 12x - 8) + x - 2 - 10 - 3$ $y = x^3 - 6x^2 + 13x - 23$	A1	2.2a	cao – condone just the expression $x^3 - 6x^2 + 13x - 23$ (so do not need to see y = …)	For reference: $a = -6,\ b = 13,\ c = -23$
				[4]			