

Question number	Scheme	Marks
3 (a)	$2x^3 + 11x^2 - x - 3 = (2x+1)(x^2 + 5x - 3)$ $(2x+1)(x^2 + 5x - 3) = 2x^3 + 10x^2 - 6x + x^2 + 5x - 3 = 2x^3 + 11x^2 - x - 3$ <p style="text-align: center;">*</p>	M1A1 cso (2)
(b)	$f(x) = 0 \quad x = \frac{-5 \pm \sqrt{(-5)^2 - 4 \times 1 \times -3}}{2 \times 1} \Rightarrow x = \frac{-5 \pm \sqrt{37}}{2}$ <p>So roots of $f(x) = 0$ are $x = -\frac{1}{2}, 0.541, -5.541$</p>	M1A1 A1 (3) [5]

Additional Notes		
Part	Mark	Guidance
(a)	M1	Attempts to multiply out the two brackets. Minimally acceptable response is as follows; <ul style="list-style-type: none"> • They must show all 6 terms in their expansion. • They must achieve $2x^3$ and another 4 correct terms. Please check these carefully, this is a show question . Accept a list of terms (with correct signs)
	A1	For the correct answer as printed with no errors or omissions.
(b)	M1	This mark is for solving equation resulting from the quadratic factor. Uses the correct quadratic formula [or completes the square] correctly to find two roots. Allow one sign error only provided the quadratic formula is seen first. If they do not quote the formula first, the substitution must be correct.
	A1	For $x = \frac{-5 \pm \sqrt{5^2 - 4 \times 1 \times (-3)}}{2}$
	A1	For all three roots seen rounded correctly to 3 decimal places . $x = -\frac{1}{2}, 0.541, -5.541$ They do not have to be on one line, but we do need to see in their answer all three roots in their working.