

10	(a)	$f(-1) = (-1)^4 + (-1)^3 - 2(-1)^2 - 4(-1) - 2$ $= 1 - 1 - 2 + 4 - 2 = 0$	E1 [1]	1.1		
10	(b)	$f(1) = 1 + 1 - 2 - 4 - 2 = -6$ or 'negative' $f(2) = 16 + 8 - 8 - 8 - 2 = 6$ or 'positive' change of sign \Rightarrow root between 1 and 2	B1 E1 [2]	1.1 2.4	both correct allow no mention of continuity of f AG	
10	(c)	long division or equating coeffs $\Rightarrow g(x) = x^3 - 2x - 2$ so $a = -2, b = -2$	M1 A1 A1 [3]	1.1 2.2a 1.1		

Question		Answer	Marks	AOs	Guidance	
10	(d)	<p>Clear explanation E.g. $f(x) = (x + 1)g(x)$ For the root of $f(x) = 0$ between 1 and 2, RHS is also zero hence $g(x) = 0$</p>	E1 [1]	2.4		
10	(e)	$x_{n+1} = x_n - \frac{g(x_n)}{g'(x_n)}$ $= x_n - \frac{x_n^3 - 2x_n - 2}{3x_n^2 - 2}$ $= \frac{3x_n^3 - 2x_n - x_n^3 + 2x_n + 2}{3x_n^2 - 2}$ $= \frac{2x_n^3 + 2}{3x_n^2 - 2}$ <p>Root 1.769 (4sf)</p>	M1 E1 A1 [3]	1.1 2.4 2.2a	AG BC	