

Q	Marking instructions	AO	Mark	Typical solution
4	<p>Explains how the factor theorem applies with reference to $f(-2) = 0$ for either function or Explains that either quadratic expression can be factorised in the form $(x + 2)(x + p)$ as $(x + 2)$ is a factor or Explains that on division by $(x + 2)$ the remainder would be zero</p>	2.4	E1	<p>As $(x + 2)$ is a factor, then when $x = -2$, $f(x) = 0$</p> $4 - 2b + c = 0$ $4 - 2d + e = 0$ $4 - 2b + c = 4 - 2d + e$ $2d - 2b = e - c$ $2(d - b) = e - c$
	<p>Uses the factor theorem with $x = -2$ substituted into one of the expressions to obtain a correct expression NB It is not necessary to equate to zero for this mark or Expands one of their factorised forms and equates coefficients correctly $(x + 2)(x + p) = x^2 + (p + 2)x + 2p$ $p + 2 = b$ $2p = c$ or Divides one of the expressions by $(x + 2)$ to obtain a correct remainder. Either one of $4 - 2b + c$ $4 - 2d + e$</p>	1.1a	M1	
	<p>Deduces both correct equations using factor theorem or division $4 - 2b + c = 0$ $4 - 2d + e = 0$ PI by $4 - 2b + c = 4 - 2d + e$ or Expands both of their factorised forms and equates coefficients to deduce the correct equations – must not use p in both</p>	2.2a	A1	
	<p>Forms a single equation for b, c, d and e and completes rigorous argument to show the required result NB R1 can be awarded even if E1 was not awarded</p>	2.1	R1	
	Total		4	