

Question			Answer	Marks	AO	Guidance
7	(a)		DR $(x + 2)^4 - 6(x + 2)^2 - 16$ $x^4 + 8x^3 + 24x^2 + 32x + 16 - 6(x^2 + 4x + 4) - 16$ $= x^4 + 8x^3 + 18x^2 + 8x - 24$ AG	B1 [1]	1.1	For this correct intermediate step or an equivalent correct expression after expansions leading to AG or a clear conclusion www.
7	(b)		DR $(x + 2)^4 - 6(x + 2)^2 - 16 = 0$ $((x + 2)^2 - 8)((x + 2)^2 + 2) = 0$ or $(x + 2)^2 = \frac{6 \pm \sqrt{36 + 64}}{2}$ oe $(x + 2)^2 = 8$ or -2 $(x + 2)^2 = -2$ has no roots $x = -2 + \sqrt{8}$ or $-2 - \sqrt{8}$	M1 A1 A1 A1 [4]	3.1a 2.1 2.3 1.1	(Applying the given identity) or $(y^2 - 8)(y^2 + 2) = 0$ or $(z - 8)(z + 2) = 0$ or $y^2 = \frac{6 \pm \sqrt{36 + 64}}{2}$ Attempt to factorise or apply formula or $y^2 = 8$ or -2 soi Somehow indicated or $y^2 = -2$ has no roots or $x = -2 + 2\sqrt{2}$ or $-2 - 2\sqrt{2}$ or $x = 0.828$ or -4.83 (3 sf) Answers only receive no credit (DR). SC B1B1 (max 2/4) for correct answers and ‘no roots’ case ($x = -2$) if only the working to solve the first quadratic is omitted.