

Question		Answer	Marks	AO	Guidance
5		$1 + 3 + 5 + \dots + (2n \pm 1)$	M1	2.1	or identify AP with n terms and $a = 1$, $d = 2$; may be implied by award of first A1
		$\frac{n}{2}(2 \times 1 + (n - 1) \times 2)$ or $\frac{n}{2}(1 + (2n - 1))$	A1	1.1	use of formula for sum of arithmetic progression with n terms and $a = 1$ and $l = 2n - 1$; or $a = 1$ and $d = 2$; allow $\frac{n}{2}(2 + 2n - 2)$ but no further contraction
		$\frac{n}{2} \times 2n = n^2$ [which is a square number]	A1	2.2a	correct intermediate step needed for A1
		Alternative method (Further Maths 1) $2 \sum_{r=1}^n r - n$	M1		from $\sum_{r=1}^n (2r - 1)$; allow for $\sum_{r=1}^n (2r + 1)$; may be implied by award of first A1
		$= 2 \times \frac{n(n+1)}{2} - n$	A1		all correct;
		$n^2 + n - n = n^2$ [which is a square number]	A1		correct intermediate step needed for A1
		Alternative method (Further Maths 2) assume $\sum_{r=1}^k (2r - 1) = k^2$ (i) working towards $\sum_{r=1}^{k+1} (2r - 1) = (k + 1)^2$ (ii) $\sum_{r=1}^k (2r - 1) + (2(k + 1) - 1)$ $= k^2 + 2k + 1$ $= (k + 1)^2$ so true for $n = k + 1$ if true for $n = k$ $2 \times 1 - 1 = 1^2$ so true for $n = 1$ so by induction true for $n = 2, 3, 4, \dots$	M1 A1 A1		correct intermediate step and statement needed
			[3]		