

Question Number	Scheme	Marks
2(a)	$\sum_{r=1}^n (3r+2) = \frac{n}{2}(2 \times 5 + (n-1)3) = \frac{n}{2}(7+3n) \quad *$	M1A1cso (2)
ALT	Splitting terms: $\sum_{r=1}^n (3r+2) = \sum_{r=1}^n 3r + \sum_{r=1}^n 2 = 3 \times \frac{n(n+1)}{2} + 2n = \frac{n}{2}(7+3n) \quad *$	M1,A1 (2)
(b)	$\sum_{r=10}^{20} (3r+2) = \sum_{r=1}^{20} (3r+2) - \sum_{r=1}^9 (3r+2)$	M1
ALT	$= \frac{20}{2}(7+3 \times 20) - \frac{9}{2}(7+3 \times 9) = 517$ $\sum_{r=10}^{20} (3r+2) = \frac{11}{2}(32+62) = 517 \quad \text{M1A1A1}$	A1A1 (3)
[5]		
(a) M1 A1cso ALT: M1 A1cso (b) M1 A1 A1cao ALT M1 A1 A1cao	Use $S = \frac{n}{2}(2a + (n-1)d)$ or $\frac{n}{2}(a+l)$ showing the correct substitution Reach given result with no errors seen Split the sum into 2 parts and use either sum formula on $\sum_{r=1}^n 3r$ or use the standard result for the sum of the first n natural numbers. Allow if $\sum_{r=1}^n 2$ or $2n$ seen Reach given result with no errors seen Use the difference of two sums with upper limit 9 or 10 for second sum Substitute correct numbers ($n = 9$ now) 517 Use summation formula with $n = 11$ or $10, a = 32, l = 62$ Substitute correct numbers ($n = 11$ now) 517 NB: (b) can be done by listing the terms and adding them $32 + 35 + \dots + 62$ with an answer seen is minimum for M1 Ignore any intermediate terms if shown. A2 correct answer Correct answer with no working shown scores 0/3	