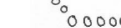



<b>1</b>	(a)		243	1	B1	cao
	(b)		Multiplying previous term by 3	1	B1	for multiplying previous term by 3 oe "×3" or $81 \times 3$
	(c)		19 683	1	B1	cao
						<b>Total 3 marks</b>

2	a		23	1	B1	
	b		Added 4	1	B1	accept +4, 4 more, oe, $4n - 1$ (need to know 4 and we need to add/go up oe)
	c	(23) 27, 31, 35, 39, 43, 47, 51, 55, 59, 63, 67, 71 <b>OR</b> $4n - 1 = 70$		2	M1	allow list of numbers going up in 4's up to 71 or more (allow one error)
			71		A1	
	d	No and identifying all terms in sequence are odd <b>OR</b> No and method to count on as far as 95 (or clearly showing 95) <b>OR</b> No and method to find $n$ when term is 96 e.g. solving $4n - 1 = 96$	No with reason	1	B1	must have 'No' oe or 'is not' oe and a reason.
						<b>Total 5 marks</b>

3	(a)		1	B1	Correct diagram
	(b)	13, 16	1	B1	Both values correct
	(c)	22	1	B1	
	(d)	$C = 3P - 2$ oe	2	B2	B1 for $3P$ or $3P + \text{constant}$ (constant $\neq -2$ )
	(e)	(Yes) pattern 28 has 136 triangles	1	B1	or $5 \times 28 - 4 = 136$ oe Sight of 28 is sufficient
					<b>Total 6 marks</b>

4	(a)		pattern 4 drawn	1	B1
	(b)		10, 12	1	B1
	(c)	14, 16, 18, 20, 22, 24, 26, 28, 30, 32 <b>or</b> $2 \times 30 + 2$ <b>or</b> $12 + (25 \times 2)$ <b>or</b> $4 + (29 \times 2)$ <b>or</b> $31 \times 2$ <b>or</b> uses or states $2n + 2$		2	M1 for adding 2 and continuing to at least pattern 15 (allow one error) <b>or</b> for a correct diagram <b>or</b> any correct method which would lead to 62
			62		A1
	(d)	E.g. $n$ th term is $2n + 2$ oe <b>or</b> gives a counter example e.g. when $n = 1$ , $2n$ gives 2 (not 4)	No with reason	1	B1 oe
					<b>Total 5 marks</b>

5		$91 - 6n$	2	<p>B2 for a correct answer in any form eg  <math>91 - 6 \times n</math> or  <math>-6n + 91</math> or  <math>85 + (n - 1)(-6)</math> oe</p> <p>(B1 for <math>-6n + k</math> oe (<math>k</math> may be zero or absent))</p> <p>NB: award full marks for eg  <math>x = 91 - 6n</math> or <math>n</math>th term = <math>91 - 6n</math>  but only B1 for <math>n = 91 - 6n</math></p>
				<b>Total 2 marks</b>

7	(a)	eg $6 \times 2.4 + 5 \times 3.5$		2	M1	
			31.9		A1	oe
	(b)	$(W = ) 5.9n$ or $(W = ) 5.9(n - 1) + 2.4$ or $(W = ) 2.4n + 3.5(n - 1)$		2	M1	for $2.4n + 3.5n$ or $5.9n$ seen
			$5.9n - 3.5$		A1	oe but must be in simplest form eg $-3.5 + 5.9n$
						<b>Total 4 marks</b>


9	(a)		2	M1 for $4n + k$ ( $k \neq -3$ ) or $4 \times n + k$ ( $k \neq -3$ ) or $n \times 4 + k$ ( $k \neq -3$ ) ( $k$ may be zero or absent)
		$4n - 3$		A1 oe e.g. $1 + (n - 1)4$ oe or $4 \times n - 3$ oe or $n \times 4 - 3$ oe NB: award full marks for eg $x = 4n - 3$ oe or $x = 4 \times n - 3$ oe or $x = n \times 4 - 3$ oe or $n$ th term = $4n - 3$ oe or $n$ th term = $4 \times n - 3$ oe or $n$ th term = $n \times 4 - 3$ oe but only M1 for $n = 4n - 3$ oe
	(b)	$6m + 5$	1	B1 for $3(2m) + 5$ oe or $6m + 5$ or $3 \times 2m + 5$ oe or $6 \times m + 5$ Allow $3(2n) + 5$ or $6n + 5$ oe
				<b>Total 3 marks</b>

**Total 4 marks**

Total 3 marksTotal 4 marks**Total 4 marks**Total 4 marks

15	(a)		Correct explanation	1	B1 eg 'she added 4', 'add 4', '+4, rule is $4n - 2$ , goes up by 4, $4 \times 5 - 2 (= 18)$
	(b)	<b>Acceptable answers</b> 1. (the) sequence is even 2. (217) is odd or not even 3. ' $n$ th term is $4n - 2$ which will always be even' 4. 'sequence goes 214, 218' 5. (the) 54 <sup>th</sup> term is 214 6. it would be 218 (not 217) 7. $4n - 2$ so $n$ is not an integer/whole number 8. $219 \div 4$ oe ( $= 54.75$ ) not an integer/whole number 9. not 2 less than a multiple of 4 10. does not end with 0, 2, 4, 6 and 8 (must have all 5 numbers) 11. each digit has an even digit at the end/does not end in an even number <b>Not acceptable answers</b> 1. adding 4 each time will not lead to 217 2. it goes past 217 3. $217 \div 4 (= 54.25)$ not an integer/whole number	Correct explanation	1	B1
Total 2 marks					

16				2	M1 for $-7n + k$ ( $k \neq 45$ ) or $-7 \times n + k$ ( $k \neq 45$ ) or $n \times -7 + k$ ( $k \neq 45$ ) ( $k$ may be zero or absent or negative)
		$45 - 7n$			A1 oe eg $45 - 7 \times n$ oe or $-7 \times n + 45$ oe or $U_n = 45 - 7n$ oe or $38 - 7(n - 1)$ oe NB: award full marks for eg $x = 45 - 7n$ oe or $n$ th term $= -7 \times n + 45$ oe or but only M1 for $n = 45 - 7n$ oe
	Correct answer scores full marks (unless from obvious incorrect working)				Total 2 marks

17	(a)		1	B1
	(b)	17, 21	1	B1 Ignore any extra numbers if the 2 that are required are there
	(c)	41	1	B1
	(d)	A correct reason	1	B1 The numbers of sticks are always an odd number (always ends in 1,3,5,7,9) 102 is even, pattern 25 has 101 sticks, The pattern goes ...97, 101, 105... It is $4n + 1$ oe $4 \times 25 + 1 = 101$ (or does not =102) The pattern never ends in a 2
Total 4 marks				