Steps to Success

Lockdown	
Date	04.02.21
Subject/s	Maths
Learning Objective	To create number patterns and write the rule

		SA	TA
Success Criteria	I can write the pattern in a table		
	I can discuss whether it is increasing and decreasing and what by		
	I can write the rule: Increasing __n + ___ Decreasing __ - ___n		
Support	Independent Adult Support ( ) Group Work		

Pre-task

What is the rule? Use algebra

What is the 11th number in the sequence?

9, 13, 17, 21....

Fluency

A

Write the first six numbers in each sequence.

	Start at	Rule		Start at	Rule		Start at	Rule
1	4	+10	6	65	−7	11	26	+9
2	38	−2	7	15	+20	12	30	−3
3	7	+3	8	110	−11	13	$\frac{1}{2}$	$+\frac{1}{2}$
4	29	−4	9	21	+2	14	80	−5
5	0·5	+1	10	948	−101	15	25	+25

B

Complete these sequences by filling in the boxes. Write the rule each time.

1. 44 47 50 53 ☐ ☐ ☐
2. 89 85 81 77 ☐ ☐ ☐
3. 115 140 165 190 ☐ ☐ ☐
4. 0·5 0·6 0·7 0·8 ☐ ☐ ☐
5. −2 −4 −6 ☐ ☐ ☐ −14
6. 119 114 ☐ ☐ ☐ 94 89
7. −9 −6 ☐ ☐ ☐ 6 9
8. $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ ☐ ☐ ☐
9. 5 3 1 ☐ ☐ ☐ −7
10. 37 ☐ 55 ☐ 73 ☐ 91
11. 366 316 ☐ 216 ☐ ☐ 66
12. ☐ −15 −10 ☐ ☐ 5 10
13. $1\frac{6}{7}$ ☐ $1\frac{2}{7}$ 1 ☐ ☐ $\frac{1}{7}$
14. ☐ ☐ 4·5 5 ☐ 6 6·5
15. ☐ 182 ☐ 380 ☐ 578 677
16. 10 6 ☐ ☐ ☐ −10 −14

C

Copy these sequences and write the next three numbers. What is the rule for each sequence? Can you write the rule for the *n*th term?

1. 84 72 60 48
2. 64 71 78 85
3. 1·1 1·07 1·04 1·01
4. 4 $3\frac{5}{8}$ $3\frac{2}{8}$ $2\frac{7}{8}$
5. 165 146 127 108
6. −9 −7 −5 −3
7. 75 67 59 51
8. 0·02 0·04 0·06 0·08
9. 15 11 7 3
10. 43 55 67 79
11. −20 −14 −8 −2
12. 5 4·5 4 3·5
13. 135 156 177 198
14. 36 28 20 12
15. 50 175 300 425
16. 1·25 1·5 1·75 2
17. 10 $8\frac{3}{4}$ $7\frac{1}{2}$ $6\frac{1}{4}$
18. −11 −8 −5 −2

Answers

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A

1 4 14 24 34 44 54
2 38 36 34 32 30 28
3 7 10 13 16 19 22
4 29 25 21 17 13 9
5 0·5 1·5 2·5 3·5 4·5 5·5
6 65 58 51 44 37 30
7 15 35 55 75 95 115
8 110 99 88 77 66 55
9 21 23 25 27 29 31
10 948 847 746 645 544 443
11 26 35 44 53 62 71
12 30 27 24 21 18 15
13 $\frac{1}{2}$ 1 $1\frac{1}{2}$ 2 $2\frac{1}{2}$ 3
14 80 75 70 65 60 55
15 25 50 75 100 125 150

B

1 ... 56 59 62	(add 3)
2 ... 73 69 65	(take 4)
3 ... 215 240 265	(add 25)
4 ... 0·9 1·0 1·1	(add 0·1)
5 ... −8 −10 −12 −14	(take 2)
6 ... 109 104 99 94 89	(take 5)
7 ... −3 0 3 6 9	(add 3)
8 ... 1 $1\frac{1}{5}$ $1\frac{2}{5}$	(add $\frac{1}{5}$)
9 ... 5 3 1 −1 −3 −5 −7	(take 2)
10 ... 37 46 55 64 73 82 91	(add 9)
11 ... 366 316 266 216 166 116 66	(take 50)
12 ... −20 −15 −10 −5 0 5 10	(add 5)
13 ... $1\frac{6}{7}$ $1\frac{4}{7}$ $1\frac{2}{7}$ 1 $\frac{5}{7}$ $\frac{3}{7}$ $\frac{1}{7}$	(take $\frac{2}{7}$)
14 ... 3·5 4 4·5 5 5·5 6 6·5	(add 0·5)
15 ... 83 182 281 380 479 578 677	(add 99)
16 ... 10 6 2 −2 −6 −10 −14	(take 4)

C

1 ... 36 24 12	$96 - 12n$
2 ... 92 99 106	$7n + 57$
3 ... 0·98 0·95 0·92	$1{\cdot}13 - \frac{3n}{100}$
4 ... $2\frac{4}{8}$ $2\frac{1}{8}$ $1\frac{6}{8}$	$4\frac{3}{8} - \frac{3n}{8}$
5 ... 89 70 51	$184 - 19n$
6 ... −1 1 3	$2n - 11$
7 ... 43 35 27	$83 - 8n$
8 ... 0·1 0·12 0·14	$\frac{2n}{100}$
9 ... −1 −5 −9	$19 - 4n$
10 ... 91 103 115	$12n + 31$
11 ... 4 10 16	$6n - 26$
12 ... 3 2·5 2	$5{\cdot}5 - \frac{5n}{10}$
13 ... 219 240 261	$21n + 114$
14 ... 4 −4 −12	$44 - 8n$
15 ... 550 675 800	$125n - 75$
16 ... 2·25 2·5 2·75	$\frac{n}{4} + 1$
17 ... 5 $3\frac{3}{4}$ $2\frac{1}{2}$	$11\frac{1}{4} - \frac{5n}{4}$
18 ... 1 4 7	$3n - 14$

Sequence	Rule	Right or wrong?	Explain it!	Why? Give examples as well as a worded explanation
Term 1 2 3 4 5 Amount 14 21 28 35 42	7n			
Term 1 2 3 4 5 Amount 11 15 19 23 27	7 + 4n			
Term 1 2 3 4 5 Amount 7 14 21 28 35	7n			
Term 1 2 3 4 5 Amount 85 82 79 76 73	3n + 82			
Term 1 2 3 4 5 Amount 1000 900 800 700 600	1100 - 100n			
Term 1 2 3 4 5 Amount 200 150 100 50 0	50n – 250			

Further Challenge

The great spell has to be broken! It has seven parts. Two children, Anna and David, must break it, but you can help...

The Mathemagician stands by his immense cauldron, flames dancing round. He stares hard at the cauldron and then at the two children.

"Tell me the next two numbers in each of these seven minor spells," chanted the Mathemagician, "and the great spell will crumble away! Watch the smoke to see the spells."

Spell the first: 1, 2, 4, 8, , .

Spell the second: 6, 13, 20, 27, , .

Spell the third: 127, 63, 31, 15, ,

Spell the fourth: 1, 3, 6, 10, 15, , .

Spell the fifth: 2, 3, 6, 11, 18, , .

Spell the sixth: 1, 8, 27, 64, , .

Spell the seventh: 216, 168, 126, 90, 60, 36, , .

Anna and David managed to break the spell, did you?