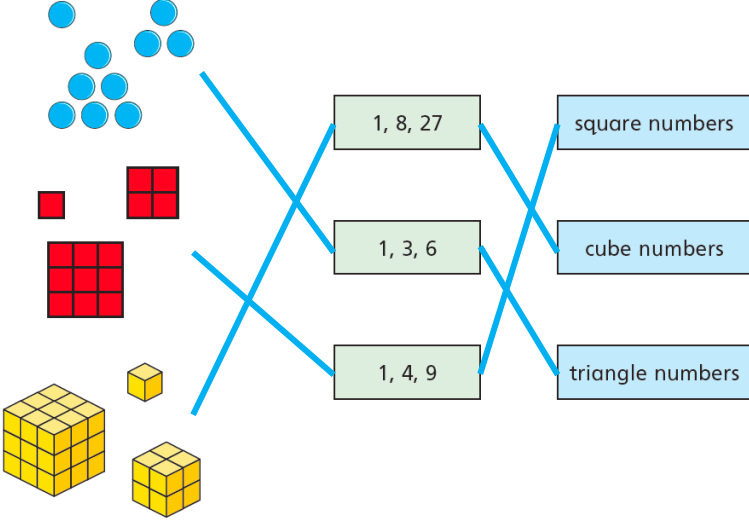


Y8 – Spring – Block 2 – Step 1 – Generate sequences given a rule in words Answers

Question	Answer
1	a) 3, 7, 11, 15, 19 b) 10, 7, 4, 1, -2 c) 1, 2, 4, 8, 16 d) 33, 17, 9, 5, 3
2	a) The first term is 4. Add 3 each time. b) The first term is 100. Subtract 20 each time. c) The first term is -10. Add 5 each time.
3	a) 6, 12, 18, 24, 30 b) -3, -6, -9, -12, -15 c) 4, 9, 14, 19, 24 d) 18, 26, 34, 42, 50 e) 7, 11, 15, 19, 23
4	
5	a) 2, 3, 5, 8, 13 b) 8, 13, 21, 34, 55 c) $a + b, a + 2b, 2a + 3b, 3a + 5b, 5a + 8b$
6	a) Add 5 squares each time. b) Add 3 squares each time.
7	a) She has not given the first term. b) multiple possible answers, e.g.: 7, 10, 13, 16, 19

Y8 – Spring – Block 2 – Step 2 – Generate sequences given a simple algebraic rule Answers

Question	Answer																																																												
1	a) 7, 14, 21, 28, 35 b) 10, 16, 22, 28, 34 c) 17, 22, 27, 32, 37 d) -2, 4, 10, 16, 22																																																												
2	<table border="1"> <tr><td>n</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>$4n$</td><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td></tr> </table> <table border="1"> <tr><td>n</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>$9n$</td><td>9</td><td>18</td><td>27</td><td>36</td><td>45</td></tr> </table> <table border="1"> <tr><td>n</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>$3n$</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td></tr> <tr><td>$3n + 9$</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td></tr> </table> <table border="1"> <tr><td>n</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>$8n$</td><td>8</td><td>16</td><td>24</td><td>32</td><td>40</td></tr> <tr><td>$8n - 15$</td><td>-7</td><td>1</td><td>9</td><td>17</td><td>25</td></tr> </table>	n	1	2	3	4	5	$4n$	4	8	12	16	20	n	1	2	3	4	5	$9n$	9	18	27	36	45	n	1	2	3	4	5	$3n$	3	6	9	12	15	$3n + 9$	12	15	18	21	24	n	1	2	3	4	5	$8n$	8	16	24	32	40	$8n - 15$	-7	1	9	17	25
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5	<table border="1"> <tr><td>n</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>$0.2n$</td><td>0.2</td><td>0.4</td><td>0.6</td><td>0.8</td><td>1.0</td></tr> </table> <table border="1"> <tr><td>n</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>$0.4n$</td><td>0.4</td><td>0.8</td><td>1.2</td><td>1.6</td><td>2.0</td></tr> <tr><td>$0.4n + 1.5$</td><td>1.9</td><td>2.3</td><td>2.7</td><td>3.1</td><td>3.5</td></tr> </table>	n	1	2	3	4	5	$0.2n$	0.2	0.4	0.6	0.8	1.0	n	1	2	3	4	5	$0.4n$	0.4	0.8	1.2	1.6	2.0	$0.4n + 1.5$	1.9	2.3	2.7	3.1	3.5																														
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6	a) 1, 4, 9, 16, 25 b) 1, 8, 27, 64, 125 c) 2, 4, 8, 16, 32																																																												

Y8 – Spring – Block 2 – Step 2 – Generate sequences given a simple algebraic rule Answers (continued)

Question	Answer					
7	n	1	2	3	4	5
	$-6n$	-6	-12	-18	-24	-30
	n	1	2	3	4	5
	$-5n$	-5	-10	-15	-20	-25
	$-5n + 2$	-3	-8	-13	-18	-23
8						
9	a) $\frac{3}{4}, 1, 1\frac{1}{4}, 1\frac{1}{2}, 1\frac{3}{4}$ b) $\frac{3}{7}, \frac{6}{7}, 1\frac{2}{7}, 1\frac{5}{7}, 2\frac{1}{7}$ The 7th term will be the first integer.					
10	a) 2, 9, 16, 23, 30					
	b) 230, 225, 220, 215, 210					
	c) $n = 21$					

Y8 – Spring – Block 2 – Step 3 – Generate sequences given a complex algebraic rule Answers

Question	Answer
1	a) 16, 28, 40, 52, 64 b) 8, 20, 32, 44, 56 c) 15, 27, 39, 51, 63 d) -9, -21, -33, -45, -57
2	a) 1, 4, 9, 16, 25 b) 1, 8, 27, 64, 125 c) 2, 12, 36, 80, 150 d) 0, 4, 18, 48, 100
3	a) $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$ b) $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}$ c) $1, \frac{1}{4}, \frac{1}{9}, \frac{1}{16}, \frac{1}{25}$ d) $1, \frac{8}{7}, \frac{11}{9}, \frac{14}{11}, \frac{17}{13}$
4	3, 5, 7, 9, 11
5	a) 1, 32, 243, 1,024, 3,125 b) They are the digits 1, 2, 3, 4, 5 c) 8 32,768
6	a) 1, 3, 6, 10, 15 b) triangle numbers
7	a) 4, 8, 16, 32, 64 b) 1, -1, 1, -1, 1 c) 0.01, 0.001, 0.0001, 0.00001, 0.000001 or $\frac{1}{100}, \frac{1}{1000}, \frac{1}{10000}, \frac{1}{100000}, \frac{1}{1000000}$
8	a) 243, 81, 27, 9, 3 b) 1 Students may use a similar method to investigate other numbers to the power 0

Question	Answer																												
1	A sequence is linear if you add or subtract the same amount each time.																												
2	<div style="display: flex; flex-wrap: wrap; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">1, 3, 5, 7, 9 ✓</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">1, 2, 4, 8, 16</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">20, 17, 14, 11, 8 ✓</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">0.8, 1, 1.2, 1.4, 1.6 ✓</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">1, 3, 6, 10, 15</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">10, -20, 30, -40</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">60, 30, 15, 7.5</div> </div>																												
3	<div style="display: flex; flex-wrap: wrap; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$2n + 3$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">4, 7, 10, 13</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$3n + 2$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">5, 7, 9, 11</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$3n + 1$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">2, 5, 8, 11</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$3n - 1$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">5, 8, 11, 14</div> </div>																												
4	<p>a) $4n$ b) $4n + 1$ c) $4n + 3$ d) $4n - 2$</p> <p>In all the sequences, 4 is added each time, so the term in n is the same. The starting numbers are different.</p>																												
5	<p>a) No. A sequence that goes up by 3 each time has the term $3n$.</p> <p>b) $3n + 8$</p>																												
6	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #d9ead3;"> <th>Sequence</th> <th>nth term</th> <th>50th term</th> <th>100th term</th> </tr> </thead> <tbody> <tr> <td>12, 24, 36, 48</td> <td>$12n$</td> <td>600</td> <td>1,200</td> </tr> <tr> <td>16, 24, 32, 40</td> <td>$8n + 8$</td> <td>408</td> <td>808</td> </tr> <tr> <td>4, 13, 22, 31</td> <td>$9n - 5$</td> <td>445</td> <td>895</td> </tr> <tr> <td>-7, -1, 5, 11</td> <td>$6n - 13$</td> <td>287</td> <td>587</td> </tr> <tr> <td>6, -12, -18, -24</td> <td>$-6n$</td> <td>-300</td> <td>-600</td> </tr> <tr> <td>-3, -8, -13, -18</td> <td>$2 - 5n$</td> <td>-248</td> <td>-498</td> </tr> </tbody> </table>	Sequence	n th term	50th term	100th term	12, 24, 36, 48	$12n$	600	1,200	16, 24, 32, 40	$8n + 8$	408	808	4, 13, 22, 31	$9n - 5$	445	895	-7, -1, 5, 11	$6n - 13$	287	587	6 , -12, -18, -24	$-6n$	-300	-600	-3, -8, -13, -18	$2 - 5n$	-248	-498
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Y8 – Spring – Block 2 – Step 4 – Find the rule for the n th term of a linear sequence (H) Answers
(continued)

Question	Answer
7	$2n + 1$ Each time, 2 lines are added to make the next term. This is the same as the coefficient of n in the n th term.
8	a) $8n - 11$ b) No. Solving the equation $8n - 11 = 1001$ does not give an integer solution for n , so there is no term with this value.
9	a) $6n - 3$ b) 7, 11, 15, 19, 23 c) $10n$ Sequence A goes up in 6s each time and sequence B goes up in 4s each time, so the sum of the two sequences will go up in 10s. The sum of the first two terms is 10, so the sequence will be the 10 times-table.
10	$\frac{n}{20} + \frac{7}{20}$ or $\frac{n+7}{20}$