

6.3 Explicit Formulas for Sequences

PRACTICE

Directions: 1-3: Choose the best explicit formula for the following sequence.

1) 40, 32, 24, 16

- $d = -8$
 $G(1) = 40$
- a) $G(n) = 48 + 8n$
 - b) $G(n) = G(n-1) - 8$
 - c) $G(n) = 40 - 8(n-1)$
 - d) $G(n) = 40 + 8(n-1)$

2) -3, -6, -12, -24

- $h_1 = -3$
 $r = 2$
- a) $h_n = (-3)(2^{n-1})$
 - b) $h_n = (2)(-3^{n-1})$
 - c) $h_n = (3)(-2^{n-1})$
 - d) $h_n = h_{n-1} \times 2$

3) 10, 20, 30, 40, 50

- $b_1 = 10$, $d = 10$
- a) $b_n = 10 - 10(n-1)$
 - b) $b_n = b_{n-2} + b_{n-1}$
 - c) $b_n = b_{n+1} + b_{n+2}$
 - d) $b_n = 10n$

$b_n = 10 + 10(n-1)$
 $b_n = 10 + 10n - 10$
 $b_n = 10n$

Directions: 4-5: Consider the following graph as a sequence plotted by (n, B(n)).

4) a) Is this an arithmetic or geometric sequence? How do you know?

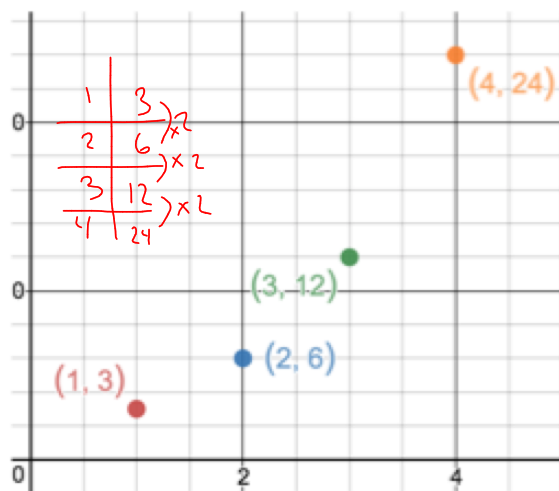
This is geometric because it forms an exponential graph.

b) What is the explicit formula for this sequence?

$B(n) = 3 \cdot 2^{n-1}$

c) What is the 10th term of the sequence?

$B(10) = 3 \cdot 2^{10-1}$
 $= 3 \cdot 2^9$
 $= 3 \cdot 512 = 1536$



5) a) Is this an arithmetic or geometric sequence? How do you know?

This is arithmetic because it forms a linear graph.

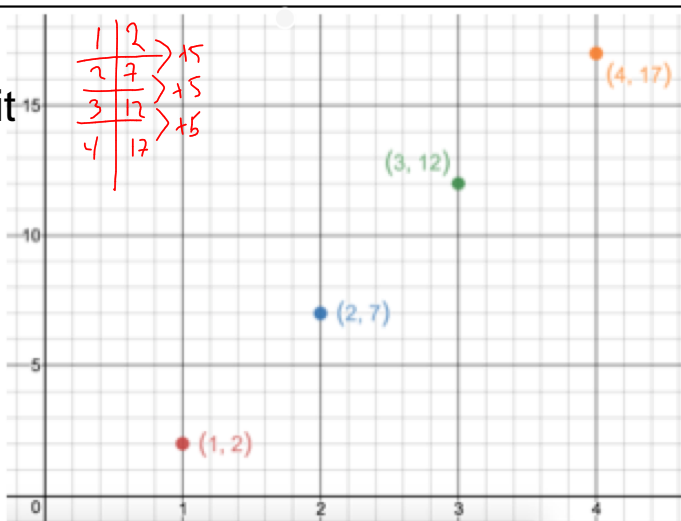
b) What is the explicit formula for this sequence?

$B(n) = 2 + 5(n-1)$

c) What is the 25th term of the sequence?

$B(25) = 2 + 5(25-1)$
 $= 2 + 5(24)$
 $= 2 + 120$

$B(25) = 122$



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Directions: 6-10: Use the sequence to answer each of the questions.		
<p>6) 1.25, 2.75, 4.25 4.25, 5.75</p> <p style="margin-left: 20px;">+1.5 +1.5 +1.5</p> <p>a) What is the explicit formula for this sequence? $A(n) = 1.25 + 1.5(n-1)$</p> <p>b) What is the 25th term of the sequence? $A(25) = 1.25 + 1.5(25-1)$ $A(25) = 1.25 + 36$ $A(25) = 37.25$</p> <p>c) Describe what the graph will look like using complete sentences. Since this is arithmetic it will form a line going up and to the right.</p>	<p>7) -5, -15, -45, -135</p> <p style="margin-left: 20px;">x3 x3 x3</p> <p>a) What is the explicit formula for this sequence? $B(n) = -5 \cdot 3^{n-1}$</p> <p>b) What is the 15th term of the sequence? $B(15) = -5 \cdot 3^{14}$ $B(15) = -5(4782969)$ $B(15) = -23914845$</p> <p>c) Describe what the graph will look like using complete sentences. Since this is an exponential sequence it will form a curve going down to the right.</p>	
<p>8) 4, 15, 26, 37</p> <p style="margin-left: 20px;">+11 +11 +11</p> <p>a) What is the explicit formula for this sequence? $M(n) = 4 + 11(n-1)$</p> <p>b) What is the 20th term of the sequence? $M(20) = 4 + 11(20-1)$ $M(20) = 4 + 11(19)$ $M(20) = 4 + 209$ $M(20) = 213$</p> <p>c) Describe what the graph will look like using complete sentences. Since this is arithmetic it will form a line going up and to the right.</p>	<p>9) 98, 89, 80, 71</p> <p style="margin-left: 20px;">-9 -9 -9</p> <p>a) What is the explicit formula for this sequence? $L(n) = 98 - 9(n-1)$</p> <p>b) What is the 30th term of the sequence? $L(30) = 98 - 9(30-1)$ $L(30) = 98 - 9(29)$ $L(30) = 98 - 261$ $L(30) = -163$</p> <p>c) Describe what the graph will look like using complete sentences. Since this is arithmetic it will form a line going down and to the right.</p>	<p>10) 200, 100, 50, 25</p> <p style="margin-left: 20px;">x1/2 x1/2 x1/2</p> <p>a) What is the explicit formula for this sequence? $C(n) = 200(\frac{1}{2}^{n-1})$</p> <p>b) What is the 10th term of the sequence? $C(10) = 200(\frac{1}{2}^9)$ $C(10) = 200(.001953125)$ $C(10) = .390625$</p> <p>c) Describe what the graph will look like using complete sentences. Since this is an exponential sequence it will form a curve going down to the right.</p>
Directions: Solve the equation. Put your solution into set notation.		Circle all the ordered pairs (x,y) that are solutions to the given equation.
<p>11) $-1 = \frac{r-1}{2} - 5$</p> <p style="margin-left: 20px;">+5 +5</p> <p style="margin-left: 20px;">$2(4) = \frac{(r-1)}{2} \cdot 2$</p> <p style="margin-left: 20px;">$8 = r-1$</p> <p style="margin-left: 20px;">+1 +1</p> <p style="margin-left: 20px;">$9 = r$</p> <p style="margin-left: 20px;">$\{9\}$</p>	<p>12) $7y - 2x = -1$</p> <p style="margin-left: 20px;">(11, 3) (0, 1) (1, -8) (-5, 1) (4, 1)</p>	

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Directions: Find the product.	Directions: Solve each inequality. Express the solution graphically and in set notation.										
<p>13) $(3k - 1)(3k^2 - 11k - 8)$ $9k^3 - 33k^2 - 24k - 3k^2 + 11k + 8$</p> <div style="border: 1px solid red; padding: 5px; width: fit-content; margin: 10px auto;"> $9k^3 - 36k^2 - 13k + 8$ </div>	<p>14) $92 > -4(x - 9)$</p> $\begin{array}{r} 92 > -4x + 36 \\ -36 & \quad -36 \\ \hline 56 > -4x \\ -4 & \quad -4 \\ \hline -14 < x \end{array}$ <div style="text-align: center; margin-top: 10px;"> </div>										
Directions: Use the dot plot to create a boxplot. Plot the Boxplot on the same axis above the dot plot.											
<p>15)</p> <div style="display: flex; align-items: center; gap: 20px;"> <div style="text-align: center;"> <p>← Plot your boxplot here, using the dot plot's number line.</p> </div> </div>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="5">5 # Summary</th> </tr> </thead> <tbody> <tr> <td>Min = 0</td> <td>Q1 = 1</td> <td>Median = 1.5</td> <td>Q3 = 4</td> <td>Max = 9</td> </tr> </tbody> </table> <p style="text-align: center; margin-top: 10px;">IQR = $4 - 1 = 3$</p>	5 # Summary					Min = 0	Q1 = 1	Median = 1.5	Q3 = 4	Max = 9
5 # Summary											
Min = 0	Q1 = 1	Median = 1.5	Q3 = 4	Max = 9							
<p>a. What percent of the students read between 1 and 9 books last summer? <i>75% of the students read between 1 and 9 books.</i></p> <p>b. The middle 50% of students read how many books? <i>The middle 50% read between 1 and 4 books. (Q1 and Q3)</i></p> <p>c. The top 25% of students read between how many books? <i>The top 25% read between 4 (Q3) and 9 (max) books.</i></p>											