

Module 3 Group Test

Name Mickey

Part I: Matching

Match each item on the left with a *different representation* from the same sequence on the right.

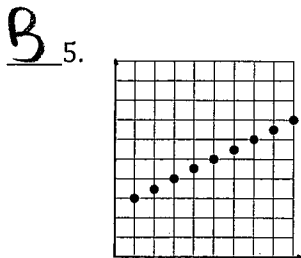
E 1. 3, 5, 7, 9, 11, ...

C 2.

x	f(x)
1	3
2	1
3	-1
4	-3
5	-5

D 3. $f(1) = 6$
 $f(x) = f(x-1) \times 2$

A 4. $f(x) = 6 \cdot \left(\frac{1}{2}\right)^x$



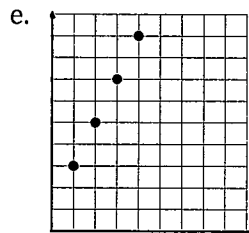
a. $3, \frac{3}{2}, \frac{3}{4}, \frac{3}{8}, \frac{3}{16}, \dots$

b.

x	f(x)
1	3
2	3.5
3	4
4	4.5
5	5

c. $f(1) = 3$
 $f(x) = f(x-1) - 2$

d. $f(x) = 3 \cdot 2^x$



Part II: Multiple Choice

6. What are the recursive and explicit functions that describes the sequence: 1, 5, 9, 13, 17, ...?

recursive
 $f(1) = 1$
 $f(n) = f(n-1) + 4$

explicit
 $f(n) = 1 + 4(n-1)$
 or $f(n) = 4n - 3$

7. What are the recursive and explicit functions that describes the sequence: 33, 11, $\frac{11}{3}$, $\frac{11}{9}$, $\frac{11}{27}$, ...?

recursive
 $f(1) = 33$
 $f(n) = f(n-1) \cdot \frac{1}{3}$

explicit
 $f(n) = 33 \cdot \left(\frac{1}{3}\right)^{n-1}$
 or $f(n) = 99 \cdot \left(\frac{1}{3}\right)^n$

8. Which recursive function best matches the explicit function: $f(x) = 3 - 2(x - 1)$?

- a. $f(1) = 3, f(x) = f(x - 1) + 5$ **c.** $f(1) = 3, f(x) = f(x - 1) - 2$
 b. $f(1) = 1, f(x) = f(x - 1) - 2$ d. $f(1) = 1, f(x) = f(x - 1) \times -2$

9. Which explicit function best matches the recursive function $f(1) = -4, f(x) = f(x - 1) + 4$?

- a.** $f(x) = -4 + 4(x - 1)$ c. $f(x) = 4x$
 b. $f(x) = -4 + 4x$ d. $f(x) = 4 - 4(x - 1)$

10. Which sequence best matches the explicit function: $f(x) = 3 \cdot (-2)^x$

- a. 6, -12, 24, -48, 96 **c.** -6, 12, -24, 48, -96
 b. -2, -6, -18, -54, -162 d. $-\frac{3}{2}, -2, -18, -54$

Part III: Short Answer

11. Write the terms of the sequence represented by the equation $f(x) = -4 + 3x$

-1	2	5	8	11
Term 1	Term 2	Term 3	Term 4	Term 5

12. What are the recursive and explicit functions that describes the sequence: 1, 2, 4, 8, 16, ...

$$\left. \begin{array}{l} \text{recursive} \\ f(1) = 1 \\ f(n) = f(n-1) \cdot 2 \end{array} \right\} \begin{array}{l} \text{explicit} \\ f(n) = 2^{n-1} \end{array}$$

13. Find the missing terms in each table (show all work for credit):

a. The sequence is arithmetic

x	1	2	3	4	5	6	7
f(x)	9	6	3	0	-3	-6	-9

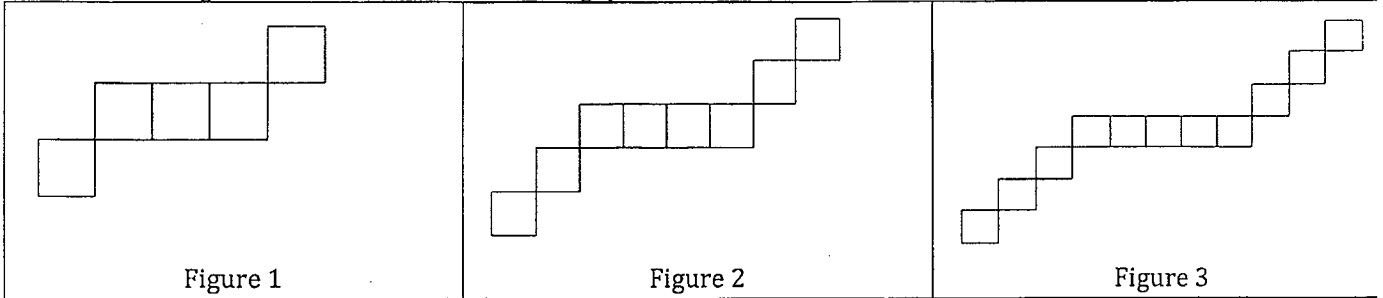
$9 + 6d = -9 \rightarrow d = -3$

b. The sequence is geometric

x	1	2	3	4	5	6
f(x)	4	12	36	108	324	972

$4 \cdot r^5 = 972 \rightarrow r^5 = 243 \rightarrow r = 3$

14. Use the image below to answer the following questions.



Use the given information to state as much as possible about the sequence above. Your answer should include: type of sequence, the common difference or common ratio, a table of at least 5 terms, a graph, the recursive rule, and the explicit rule.

<p>Type of Sequence: <i>Arithmetic</i></p> <p>Common difference/ratio: <i>d = 3</i></p>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;"><i>x</i></th> <th style="padding: 5px;"><i>f(x)</i></th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"><i>1</i></td> <td style="padding: 5px;"><i>5</i></td> </tr> <tr> <td style="padding: 5px;"><i>2</i></td> <td style="padding: 5px;"><i>8</i></td> </tr> <tr> <td style="padding: 5px;"><i>3</i></td> <td style="padding: 5px;"><i>11</i></td> </tr> <tr> <td style="padding: 5px;"><i>4</i></td> <td style="padding: 5px;"><i>14</i></td> </tr> <tr> <td style="padding: 5px;"><i>5</i></td> <td style="padding: 5px;"><i>17</i></td> </tr> </tbody> </table>	<i>x</i>	<i>f(x)</i>	<i>1</i>	<i>5</i>	<i>2</i>	<i>8</i>	<i>3</i>	<i>11</i>	<i>4</i>	<i>14</i>	<i>5</i>	<i>17</i>	
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<i>5</i>	<i>17</i>													
<p>Recursive rule: <i>f(n) = f(n-1) + 3</i> <i>f(1) = 5</i></p> <p>Explicit rule: <i>f(n) = 3n + 2</i> <i>f(n) = 5 + 3(n-1)</i></p>	<p>Graph (label and scale):</p>													
<p>How many tiles are in figure 225?</p> <p style="text-align: center; font-size: 2em;"><i>677</i></p>														

Challenge: The equation below represents part of a recursive function that describes a sequence where $f(x)$ represents the amount of money in Serena's account (in dollars) and x represents the number of weeks. If Serena has \$50 in her account during Week 3, how much money will Serena have on Week 13?
 $f(x) = f(x-1) + 14$

\$ 190