Learning Goal 11.1: Sequences

Name: _____   **Date:** _____

1. Which sequence is arithmetic?

    A. 4 8 16 32 64 ...

    B. 11 12 14 17 21 ...

    C. 28 15 2 −11 −24 ...

    D. 30 −25 20 −15 10 ...

2. The first five terms of a linear sequence are shown below.

$$8,\ 6,\ 4,\ 2,\ 0,\ldots$$

    What is the 100th term in the sequence?

    A. −192   B. −190   C. −108   D. −90

3. Look at the recursive formula.

    $A_1 = 6$

    For $n > 1, A_n = A_{(n-1)} + 4$

    What are the first 4 terms of this sequence?

    A. 5, 6, 7, 8   B. 6, 10, 14, 18

    C. 9, 12, 15, 18   D. 10, 14, 18, 22

4. Assuming this pattern continues, what will be the seventh term in the sequence?

$$-3,\ 6,\ -12,\ 24,\ \underline{\quad},\ \underline{\quad},\ ?$$

    A. 192   B. 96   C. −96   D. −192

5. Given $a_1 = 1$ and $a_n = a_{n-1} + 2$. Find a_7.

    A. 7   B. 9   C. 11   D. 13

6. This list shows the first four terms of a geometric sequence.

$$4,\ 2,\ 1,\ \tfrac{1}{2},\ldots$$

    Which function can be used to determine the nth term of this sequence?

    A. $f(n) = 4 - 2^n$ B. $f(n) = 4 - 2^{n-1}$

    C. $f(n) = 4(\tfrac{1}{2})^n$ D. $f(n) = 4(\tfrac{1}{2})^{n-1}$

7. Which function describes the sequence 3, 6, 12, 24, ... for $n = 1, 2, 3, \ldots$?

    A. $f(n) = 3n$ B. $f(n) = n^2 + 2$

    C. $f(n) = 3(2^{n-1})$ D. $f(n) = (n-1)^2 + 3$

8. Which rule applies to the table below?

x	−2	−1	0	1	2
y	81	27	9	3	1

    A. $y = 9 \cdot 3^x$ B. $y = 3 \cdot 9^x$

    C. $y = 3 \cdot \left(\tfrac{1}{9}\right)^x$ D. $y = 9 \cdot \left(\tfrac{1}{3}\right)^x$

9. A sequence is shown.

$$-1\ \ -7\ \ -13\ \ -19\ \ -25\ \ldots$$

    What is the function rule for the sequence?

    A. $f(x) = x - 6$ B. $f(x) = -6x$

    C. $f(x) = 5x - 6$ D. $f(x) = -6x + 5$

10. Which recursive rule would be applied to the sequence 2, 3, 4.5, 6.75, ... ?

$$a_n = n^{th} \text{ term}$$
$$a_1 = \text{first term}$$
$$a_{n-1} = \text{previous term}$$

A. $\begin{cases} a_1 = 2 \\ a_n = (a_{n-1})^2 \end{cases}$ B. $\begin{cases} a_1 = 2 \\ a_n = 1.5a_{n-1} \end{cases}$

C. $\begin{cases} a_1 = 2 \\ a_n = 0.5a_{n-1} \end{cases}$ D. $\begin{cases} a_1 = 2 \\ a_n = 1.5a(n-1) \end{cases}$

11. Which recursive rule describes the sequence 3, 7, 11, 15, ... ?

$$a_1 = \text{first term}$$
$$a_n = n\text{th term}$$
$$a_{n-1} = \text{previous term}$$

A. $\begin{cases} a_1 = 3 \\ a_n = 3a_{n-1} - 2 \end{cases}$ B. $\begin{cases} a_1 = 3 \\ a_n = 4a_{n-1} - 5 \end{cases}$

C. $\begin{cases} a_1 = 3 \\ a_n = 2a_{n-1} + 1 \end{cases}$ D. $\begin{cases} a_1 = 3 \\ a_n = a_{n-1} + 4 \end{cases}$

12. The sequence below shows the total number of days Francisco had used his gym membership at the end of weeks 1, 2, 3, and 4.

$$4, \ 9, \ 14, \ 19, \ \ldots$$

Assuming the pattern continued, which function could be used to find the total number of days Francisco had used his gym membership at the end of week n?

A. $f(n) = n + 5$ B. $f(n) = 5n - 1$

C. $f(n) = 5n + 4$ D. $f(n) = n^2$

13. An auditorium has 30 rows of seats. The first row has 40 seats. The second row has 42 seats. The third row has 44 seats. Each successive row has two more seats than the row before it. How many seats are there in the 30th row?

A. 70 seats B. 74 seats

C. 98 seats D. 100 seats

14. A bus pass has an initial value of $20.

The amount of money left, a_{n+1}, after n days is given by the recursive formula shown.

$$a_1 = 20$$
$$a_{n+1} = a_n - 1.50$$

What amount is on the card after 6 days?

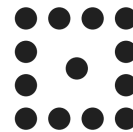A. $4.50 B. $11.00 C. $14.00

15.

figure 1   figure 2   figure 3
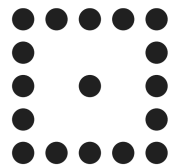
Juan made the first three figures of a pattern. Which function represents the number of dots, $f(n)$, in figure n?

A. $f(n) = 4n + 5$ B. $f(n) = 5n + 2$

C. $f(n) = 6n + 1$ D. $f(n) = 8n + 1$

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1.
Answer: C

2.
Answer: B

3.
Answer: B

4.
Answer: D

5.
Answer: D

6.
Answer: D

7.
Answer: C

8.
Answer: D

9.
Answer: D

10.
Answer: B

11.
Answer: D

12.
Answer: B

13.
Answer: C

14.
Answer:

15.
Answer: A