

## Sequences

*Arithmetic (d-common difference)*

Recursive Formula:  $\text{NEXT} = \text{NOW} + d$

Explicit Formula:  $a_n = a_1 + (n-1)d$

*Geometric (r – common ratio)*

Recursive Formula:  $\text{NEXT} = \text{NOW} * r$

Explicit Formula:  $g_n = g_1 * r^{n-1}$

1. The sequence below shows the number of trees a nursery plants each year.

2, 8, 32, 128

Which formula could be used to determine the number of trees the nursery will plant next year, NEXT, if the number of trees planted this year, NOW, is known?

- a.  $\text{NEXT} = 4 * \text{NOW}$
- b.  $\text{NEXT} = \frac{1}{4} \text{NOW}$
- c.  $\text{NEXT} = 2 * \text{NOW} + 4$
- d.  $\text{NEXT} = \text{NOW} + 6$

2. An arithmetic sequence is shown below.

5, 8, 11, 14, 17,...

Which recursive formula models the sequence?

- a.  $\text{NEXT} = \text{NOW} + 2$ , starting at 5
- b.  $\text{NEXT} = \text{NOW} + 3$ , starting at 5
- c.  $\text{NEXT} = 2 \bullet \text{NOW} + 3$ , starting at 5
- d.  $\text{NEXT} = 3 \bullet \text{NOW} + 2$ , starting at 5

3. The formula  $\text{NEXT} = \text{NOW} - 7$  models a sequence. The first term of the sequence is 5. What is the fourth term of the sequence?

- a. -9
- b. -16
- c. -17
- d. -21

4. Which recursive formula models the sequence shown below?

-3, 1, 5, 9,...

- a.  $\text{NEXT} = \text{NOW} + 4$
- b.  $\text{NEXT} = \text{NOW} - 4$
- c.  $\text{NEXT} = 4 \bullet \text{NOW}$
- d.  $\text{NEXT} = 4 \bullet \text{NOW} - 7$

5. The first term of a sequence is 13. Each term in the sequence is 12 more than the previous term. Which explicit equation can be used to determine the  $n$ th term of the sequence?

- a.  $a_n = n + 12$
- b.  $a_n = 12n + 1$
- c.  $a_n = 12n + 13$
- d.  $a_n = 13n$

6. A sequence is shown below:

-1.5, -1.25, -1, -0.75, ...

- a.  $a_n = 0.25n - 1.75$
- b.  $a_n = n + 0.25$
- c.  $a_n = n - 2.5$
- d.  $a_n = -1.5n$

7. 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

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.  $F(n) = n^2$

8. Given the following sequence, find the common difference: 99, 87, 75, 63, 51, ...

- a.  $D = 12$
- b.  $D = -12$
- c.  $D = 10$
- d.  $D = -10$

9. Given the following sequence:

8, 4, 0, -4, ...

Chose the correct **explicit** formula that represents this sequence:

- a.  $a_n = 8 \cdot (-4)^{n-1}$
- b.  $a_n = 8 + -4(n-1)$
- c. NEXT = NOW  $\cdot (-4)$
- d. NEXT = NOW +  $(-4)$