

Sequences

Arithmetic (d-common difference)

Recursive Formula: NEXT = NOW + d

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

Geometric (r-common ratio)

Recursive Formula: NEXT = NOW * r

Explicit Formula: $a_n = a_1 * r^{n-1}$

Key

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

2, 8, 32, 128 *x4 each time*

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. NEXT = 4 * NOW
b. NEXT = 1/4 NOW
c. NEXT = 2 * NOW + 4
d. NEXT = NOW + 6

2. An arithmetic sequence is shown below.

5, 8, 11, 14, 17, ... *add 3 each time*

Which recursive formula models the sequence?

- a. NEXT = NOW + 2, starting at 5
b. NEXT = NOW + 3, starting at 5
c. NEXT = 2 * NOW + 3, starting at 5
d. NEXT = 3 * NOW + 2, starting at 5

3. The formula NEXT = 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

1st term 5
2nd term -2
3rd term -9
4th term -16

4. Which recursive formula models the sequence shown below?

-3, 1, 5, 9, ... *add 4 each time*

- a. NEXT = NOW + 4
b. NEXT = NOW - 4
c. NEXT = 4 * NOW
d. NEXT = 4 * 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 nth term of the sequence?

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

6. A sequence is shown below:

-1.5, -1.25, -1, -0.75, ... *adding .25 each time*

- a. an = 0.25n - 1.75
b. an = n + 0.25
c. an = n - 2.5
d. an = -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 *adding 5 each time*

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 *-12 each time*

9. Given the following sequence:

8, 4, 0, -4, ... *-4 each time*

Choose the correct explicit formula that represents this sequence:

- a. an = 8 * (-4)^(n-1)
b. an = 8 + -4(n-1)
c. NEXT = NOW * (-4)
d. NEXT = NOW + (-4)