Number sequence questions require you to crack the pattern among the given numbers to identify the missing one correctly. With ample practice and familiarity with common number patterns, your chances of passing this subtest improve.

This article will help you prepare for number sequence questions that commonly appear in various examinations.

What is a Number Sequence?

In plain words, a number sequence consists of numbers that follow a particular pattern. Each number in a sequence is called a **term**.

For instance, *2, 4, 6, 8, 10, …* is a number sequence since it consists of numbers that follow a certain pattern.

Can you guess the pattern of the sequence above? Yes, these are the numbers you'll get if you count by 2's.

Questions involving number sequence challenge you to determine the missing term based on the pattern of the given sequence. Here's an example:

19, 22, 25, 28, _____

What number must be placed in the blank?

To determine the missing term, we need to identify first the pattern of the given numerical sequence. By examining the given numbers, we can see that the next term is obtained by adding three to the previous term:

19 + 3 = 22
22 + 3 = 25

$$25 + 3 = 28$$

Given this pattern, we can find the missing term by adding three to 28:

$$28 + 3 = 31$$

Therefore, the missing term in the given number sequence is 31.

From our example above, we saw how important it is to know the pattern that the number sequence follows. It will be impossible to guess the missing number if we cannot figure out the pattern. Therefore, learning some commonly used number sequence patterns in exams is helpful. In our next section, we will discuss these patterns in-depth.

Typical Number Sequence Patterns

Number Sequence Pattern	Example
Arithmetic Sequence	5, 8, 11, 14, 17, …
Geometric Sequence	5, 10, 20, 40, 80, …
Recursive Sequence	1, 3, 4, 7, 11, 18, 29, …
Alternating Sequence	3, 5, 15, 17, 51, …
Perfect Square Number Pattern	1, 4, 9, 16, 25, 36, …
Perfect Cube Number Pattern	1, 8, 27, 64, …
Triangular Number Pattern	1, 3 , 6, 10, 15, …
Prime Number Pattern	17, 19, 23, 29, …

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Number Sequences

Increasing Difference Pattern	5, 7, 10, 14, 19, …
Decreasing Difference Pattern	72, 70, 67, 63, 58, …

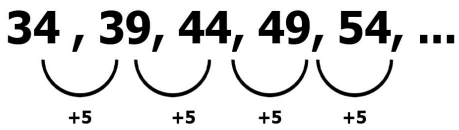
1. Arithmetic Sequence

In an arithmetic sequence, each succeeding term is obtained by adding a number to the previous term. This number that is being added to the terms is called the **common difference.**

See the example below:

34, 39, 44, 49, 54, …

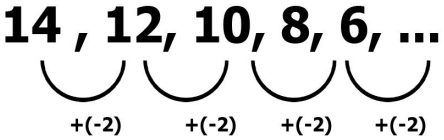
The sequence above is an arithmetic sequence because a particular number (5) is added to each term to get the succeeding term.



Note that the common difference can be a negative number as well. Here's an example:

14, 12, 10, 8, 6, …

In the given sequence above, the common difference is a negative number which is 2. A negative common difference also means subtracting a particular number from the previous term to get the next one.



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To God be the glory!

Sample Problem 1: What is the next term in 94, 97, 100, 103, _____?

Solution: The number sequence is an arithmetic sequence with a common difference of 3. Hence, the missing number can be found by adding 3 to 103: 103 + 3 = 106. Hence, the missing number is 106.

Sample Problem 2: What are the missing numbers in the sequence 9, 15, ____, 27, ____?

Solution: The number sequence is an arithmetic sequence with a common difference of 6. Thus, to find the missing numbers, we only need to add 6 to 15 and the same with 27.

- First missing number: 15 + 6 = 21
- Second missing number: 27 + 6 = 33

Therefore, the missing numbers are 21 and 33.

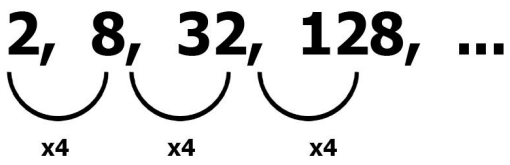
2. Geometric Sequence

In a geometric sequence, each succeeding term is obtained by multiplying a number by the previous term. This number multiplied by the terms is called the **common ratio.**

Like the common difference, the common ratio can be positive or negative.

Below is an example of a geometric sequence:

2, 8, 32, 128, …



Each sequence term is multiplied by 4 to get the succeeding term. Thus, the common ratio of this geometric sequence is 4.

Sample Problem 1: What number must be placed in the blank to complete the sequence 3, 15, 75, _____?

Solution: This is a geometric sequence with a common ratio of 5. Hence, the missing term can be obtained by multiplying 75 by 5: 75 x 5 = 375. Hence, the missing term is 375.

Sample Problem 2: 72, 36, 18, _____

Solution: In this geometric sequence, the common ratio is a fraction (or decimal) which is ½. This means that to get the next term, we multiply ½ (or divide by 2) the previous term. Note that multiplying a number by a fraction is equivalent to dividing that number by the fraction's denominator. Thus, a geometric sequence with a common ratio that is a fraction can be interpreted as the division of the terms by a constant number.

$$72 \times \tfrac{1}{2} = 36$$
$$36 \times \tfrac{1}{2} = 18$$

Therefore, the missing term can be determined by multiplying ½ by 18 (or dividing 18 by 2):

$$18 \times \tfrac{1}{2} = 9$$

Thus, the missing term is 9.

3. Recursive Sequence

A recursive sequence is a sequence in which each succeeding term is defined in terms of the previous term.

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Number Sequences

A common type of recursive sequence is the **Fibonacci sequence**. We add the two previous terms in a Fibonacci sequence to get the next one.

Here's an example:

1, 1, 2, 3, 5, 8, …

In this sequence, the succeeding term is obtained by adding two previous terms. For example, to get "2," we need to add "1" and "1" (two terms behind 2). Similarly, to get 8, we add "3" and "5" (two terms behind 8).

Sample Problem 1: Find the missing term in 2, 6, 8, 14, 22, _____

Solution: The given sequence is recursive such that the succeeding term is obtained by adding two previous terms. For instance, "14" is obtained by adding two terms behind it which are "8" and "6".

Therefore, to find the missing term. We need to add the numbers behind the blank, which are "14" and "22": 14 + 22 = 36.

Thus, the missing number is 36.

Sample Problem 2: Identify the missing number: ____, 6, 10, 16, 26, …

Solution: The given sequence is recursive such that the succeeding term is obtained by adding two previous terms. For example, "26" is obtained by adding two terms behind it which are "10" and "16".

To identify the missing number, we recognize that "10" was obtained by adding "6" and the missing number. Hence, the missing number should be 10 - 6 = 4.

The answer is 4.

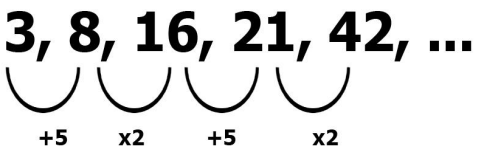
4. Alternating Sequence

In an alternating sequence, the mathematical operations are used alternately to get the succeeding terms.

Here's an example:

3, 8, 16, 21, 42, …

In this sequence, the operations "addition" and "multiplication" were used to derive the succeeding terms.



3 **+ 5** = 8 **x 2 =** 16 **+ 5** = 21 **x 2** = 42

Sample Problem: Determine the missing term in 6, 7, 21, 22, 66, _____

Solution: The sequence alternately adds 1 to and multiplies 3 by the terms to get the succeeding terms.

6 + 1 = 7
7 x 3 = 21
21 + 1 = 22
22 x 3 = 66

The sequence ends with multiplication by 3, so the next operation should be the addition of 1:

66 + 1 = 67

Therefore, the missing number is 67.

5. Perfect Square Number Pattern

In this type of sequence, the squares of whole numbers are listed numerically. Recall that the square of a number is the result when you multiply a number by itself.

For instance, the square of 9 is 81 since 9 x 9 = 81.

Here's an example:

4, 16, 36, 64, 100, …

The sequence above is the squares of the even numbers from 2 to 10:

2 x 2 = 4
4 x 4 = 16
6 x 6 = 36
8 x 8 = 64
10 x 10 = 100

Sample Problem: What is the missing term in 1, 9, 25, 49, _____?

Solution: The sequence above is the squares of the odd numbers.

1 x 1 = 1
3 x 3 = 9
5 x 5 = 25
7 x 7 = 49

The odd number next to 7 is 9. So, to get the next term, we have to square 9:

9 x 9 = 81

Therefore, the missing term is 81.

6. Perfect Cube Number Pattern

In this type of sequence, the cubes of whole numbers are listed numerically. Recall that the cube of a number is the result when you multiply a number by itself thrice.

For instance, the cube of 2 is 8 since 2 x 2 x 2 = 8

Sample Problem: Determine the missing term:

1, 8, 27, 64, 125, ____,

Solution: The sequence above follows the perfect cube number pattern in which the first 5 whole numbers were cubed.

$1^3 = 1 \times 1 \times 1 = 1$
$2^3 = 2 \times 2 \times 2 = 8$
$3^3 = 3 \times 3 \times 3 = 27$
$4^3 = 4 \times 4 \times 4 = 64$
$5^3 = 5 \times 5 \times 5 = 125$

Hence, the missing term should be the cube of 6:

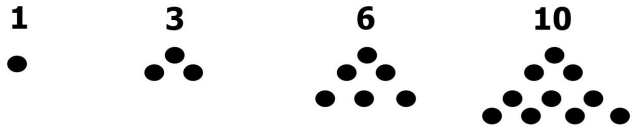
$$6^3 = 6 \times 6 \times 6 = 216$$

The cube of 6 is 216. Therefore, the missing term is 216.

7. Triangular Numbers Pattern

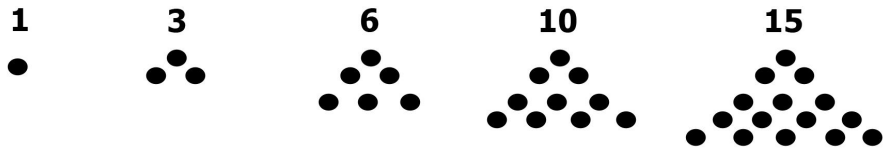
In this pattern, the numbers form a triangle by visualizing it using dots.

Take a look at the example below:



The number sequence 1, 3, 6, 10, …, if visualized using dots, forms a triangle that is increasing in size.

We can determine the succeeding term of this pattern by adding dots to the last triangle. To determine the number of dots for the next triangle, the “side” of each succeeding triangle must be one more than the previous one. In the triangular number 1, the side has 1 dot. In the triangular number 3, each side has 2 dots. In the triangular number 6, each side has 3 dots, and so on.



So the succeeding term in 1, 3, 6, 10, … should form a triangle whose “side” has five dots. That triangular number is 15.

8. Prime Number Pattern

In this number pattern, we list the prime numbers in ascending or descending order. Note that a prime number is a whole number whose factors are only one and itself.

Here’s an example of a prime number pattern:

2, 3, 5, 7, 11, …

The numbers above follow the prime number pattern.

Sample Problem: Determine the next term in 17, 19, 23, _____

Solution: 17, 19, and 23 are prime numbers because these numbers have two factors only (1 and themselves). To find the missing term, we need to identify the prime number next to 23.

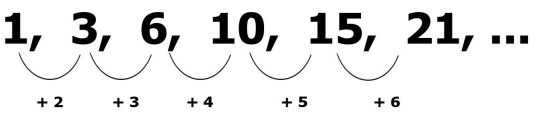
24, 25, 26, 27, and 28 are not prime numbers (i.e., composite numbers). 29 is the prime number next to 23.

Thus, the missing term is 29.

9. Increasing Difference Pattern

In this number pattern, the terms follow an increasing difference between numbers. To better illustrate this pattern, see the example below:

1, 3, 6, 10, 15, 21, ___

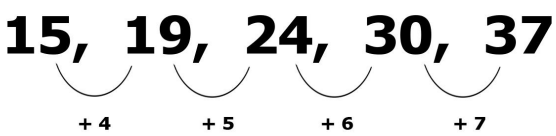


The difference between the numbers is increasing by 1 as it goes further to the right of the sequence. Based on our illustration above, we can obtain the next term by adding 7 to 21:

$$21 + 7 = 28$$

Therefore, the missing term is 28.

Sample Problem 1: Determine the missing term in 15, 19, 24, 30, 37, _____



Solution: The difference between the numbers is increasing by 1. Hence, we must add 8 to 37 to get the missing number: 37 + 8 = 45.

Thus, the missing number is 45.

Sample Problem 2: Determine the missing term in 54, 56, 60, 66, 74, ____

Solution: The difference between the numbers is increasing by 2s:

54 **+ 2** = 56
56 **+ 4** = 60
60 **+ 6** = 66
66 **+ 8** = 74

Hence, the missing term can be calculated by adding 10 to 74:

74 + 10 = 84

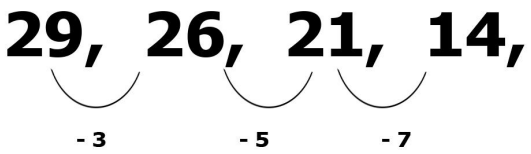
Thus, the missing term is 84.

10. Decreasing Difference Pattern

This pattern is the opposite of the previous pattern (the increasing difference pattern). In this number sequence pattern, the difference between the numbers is decreasing.

Sample Problem: Identify the missing term in 29, 26, 21, 14, _____

Solution: The difference between the numbers is decreasing by 2s:



This means that to get the next term, we need to subtract 14 by 9: 14 - 9 = 5.

Therefore, the answer is 5.