

Number Series

Generally, two kinds of series are asked in the examination. One is based on numbers and the other based on alphabets.

In questions based on series, some numbers or alphabets are arranged in a particular sequence. You have to decipher that particular sequence of numbers or alphabets and on the basis of that deciphered sequence, find out the next number or alphabet of the series. Although there is no limit of logics which can be used to build a series, here are some important examples given which highlight the type of series asked in the examination.

How to solve number series problems:

Step 1: Observe are there any familiar numbers in the given series. Familiar numbers are primes numbers, perfect squares, cubes ... which are easy to identify.

Step 2: Calculate the differences between the numbers. Observe the pattern in the differences. If the differences are growing rapidly it might be a square series, cube series, or multiplicative series. If the numbers are growing slowly it is an addition or subtraction series.

If the differences are not having any pattern then

1. It might be a double or triple series. Here every alternate number or every 3rd number form a series
2. It might be a sum or average series. Here sum of two consecutive numbers gives 3rd number. or average of first two numbers give next number

Step 3: Sometimes number will be multiplied and will be added another number So we need to check those patterns

TYPES :

I. Prime number Series :

Example (1) : 2,3,5,7,11,13,

Answer : The given series is prime number series . The next prime number is 17.

Example (2) : 2,5,11,17,23,.....41.

Answer: The prime numbers are written alternately.

II. Difference Series : Example (1): 2,5,8,11,14,17,.....,23.

Answer: The difference between the numbers is 3. ($17+3 = 20$)

Example (2): 45,38,31,24,17,.....,3.

Answer: The difference between the numbers is 7. ($17-7=10$).

III. Multiplication Series: Example (1) : 2, 6, 18, 54, 162,, 1458.

Answer: The numbers are multiplied by 3 to get next number. ($162 \times 3 = 486$).

Example: (2) : 3, 12, 48, 192,, 3072.

Answer : The numbers are multiplied by 4 to get the next number. ($192 \times 4 = 768$).

IV. Division Series:

Example (1): 720, 120, 24,, 2, 1

Answer: $720/6=120$, $120/5=24$, $24/4=6$, $6/3=2$, $2/2=1$.

Example (2) : 32, 48, 72, 108,, 243.

Answer: 2. Number $\times 3/2 =$ next number. $32 \times 3/2 = 48$, $48 \times 3/2 = 72$, $72 \times 3/2 = 108$, $108 \times 3/2 = 162$.

V. n^2 Series:

Example(1) : 1, 4, 9, 16, 25,, 49

Answer: The series is 12, 22, 32, 42, 52, The next number is $62=36$;

Example (2) : 0, 4, 16, 36, 64, 144.

Answer : The series is 02, 22, 42, 62, etc. The next number is $102=100$.

VI. $n^2 - 1$ Series :

Example : 0, 3, 8, 15, 24, 35, 48,,

Answer : The series is $12-1$, $22-1$, $32-1$ etc. The next number is $82-1=63$.

Another logic : Difference between numbers is 3, 5, 7, 9, 11, 13 etc. The next number is ($48+15=63$).

VII. $n^2 + 1$ Series :

Example : 2, 5, 10, 17, 26, 37,, 65.

Answer : The series is $12+1$, $22+1$, $32+1$ etc. The next number is $72+1=50$.

VIII. $n^2 + n$ Series (or) $n^2 - n$ Series :

Example : 2, 6, 12, 20,, 42.

Answer : The series is $12+1$, $22+2$, $32+3$, $42+4$ etc. The next number = $52+5=30$.

Another Logic : The series is 1×2 , 2×3 , 3×4 , 4×5 , The next number is $5 \times 6=30$.

Another Logic : The series is $22-2$, $32-3$, $42-4$, $52-5$, The next number is $62-6=30$.

IX. n^3 Series :

Example : 1, 8, 27, 64, 125, 216,

Answer : The series is 13, 23, 33, etc. The missing number is $7^3=343$.

X. $n^3 + n$ Series :

Example : 2, 9, 28, 65, 126, 217, 344,

Answer : The series is $13+1$, $23+1$, $33+1$, etc. The missing number is $8^3+1=513$.

XI. $n^3 - 1$ Series :

Example : 0, 7, 26, 63, 124,, 342.

Answer: The series is $13-1$, $23-1$, $33-1$ etc The missing number is $6^3-1=215$.

XII. $n^3 + n$ Series :

Example : 2, 10, 30, 68, 130,, 350.

Answer : The series is $13+1$, $23+2$, $33+3$ etc The missing number is $6^3+6=222$.

XIII. $n^3 - n$ Series :

Example : 0, 6, 24, 60, 120, 210,,

Answer : The series is $13-1$, $23-2$, $33-3$, etc. The missing number is $7^3-7=336$.

Another Logic : The series is $0 \times 1 \times 2$, $1 \times 2 \times 3$, $2 \times 3 \times 4$, etc. The missing number is $6 \times 7 \times 8=336$.

XIV. $n^3 + n^2$ Series :

Example : 2, 12, 36, 80, 150,,

Answer: The series is $13+12$, $23+22$, $33+32$ etc. The missing number is $6^3+6^2=252$

XV. $n^3 - n^2$ Series:

Example: 0, 4, 18, 48, 100,,

Answer : The series is $13-12$, $23-22$, $33-32$ etc. The missing number is $6^3-6^2=180$

XVI. xy , $x+y$ Series:

Example: 48, 12, 76, 13, 54, 9, 32,,

Answer : 2. $4+8=12$, $7+6=13$, $5+4=9$ $\therefore 3+2=5$.

XVII. Image Series or (Interchange Series):

Example : 34, 81, 72, 47, 74, 27, 18,

Answer : (47, 74), (72, 27), (81, 18), are images. \therefore Image of 34 is 43.