UDAAN

2026

Arithmetic Progressions

MATHS | LECTURE-1

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Topics *to be covered*

A Meaning of Sequence, Progression and Arithmetic Progression

B General term of an A.P.

C Basic Questions

D. Introduction

Triangle

Coordinate geometry

Mid-term Exam

Science

Maths

Nov end

7 → dear.

How to revise?

Go through notes.

Question Bank..
Made easy.

Marathon

What is a Sequence

A sequence is an arrangement of numbers in a definite order according to some rule.

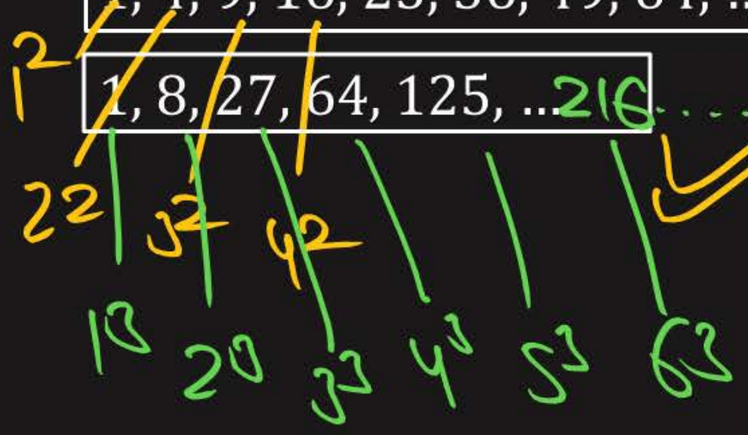
3, 6, 9, 12, 15, 18, 21, ... ,24 .....

7, 11, 15, 19, 23, 27, 31, 35, ...39, 43 .....

+4 +4 +4

1, 4, 9, 16, 25, 36, 49, 64, ...

1, 8, 27, 64, 125, ...216 .....



3 key multiple.

+3

Squares of natural no.

Cube of natural no.

2, 9, 7, 4, 0, 11, 13, 19, 24, 15 ------

Q Is this a sequence?

Ans No

terms

2, 4, 6, 8, 10 - - - - - - → $2n$, $n \in N$, $a_n = 2n$

$a_{10} = ?$ (10th term) → $a_{10} = 20$

1, 3, 5, 7, 9, 11, 13 - - - - → $a_n = 2n-1$, $n \in N$

First term. Second term. Sixth term.

1, 4, 9, 16, 25, 36, 49 - - → $a_n = n^2$

a_1, a_2, a_3, a_4, a_5, a_6, a_7

1, 8, 27, 64, 125 - - - - - - → $a_n = n^3$

$a = a_1$, a_2, a_3, a_4, a_5

General term → n^{th} term

2nd term $= a_2$

10th term $= a_{10}$

100th term $= a_{100}$

501st term $= a_{501}$.

n^{th} term $= a_n$ → n^{th} position par jo term hai.

#Q. Write the first three terms in each of the sequence defined by the following:

(i) $a_n = 3n + 2$

n^{th} term (general term)

general term kuu formula sy aap koi bhi term nikal sakat hain.

$a_n = 3n+2$

$n=1,\ a_1 = 3(1)+2 = \boxed{5}$

$n=2,\ a_2 = 3(2)+2 = \boxed{8}$

$n=3,\ a_3 = 3(3)+2 = \boxed{11}$

$\boxed{5, 8, 11 \ldots\ldots}$

#Q. Write the first three terms in each of the sequence defined by the following:

(ii) $a_n = n^2 + 1$

$n=1,\ a_1 = (1)^2 + 1 = 2$

$n=2,\ a_2 = (2)^2 + 1 = 5$

$n=3,\ a_3 = (3)^2 + 1 = 10$

$a_{50} = ?$

$n=50,\ a_{50} = (50)^2 + 1$

$= 2500 + 1$

$= 2501$

#Q. Write the first five terms of the sequence defined by $a_n = (-1)^{n-1} \cdot 2^n$

$a_n = (-1)^{n-1} \cdot 2^n$

$n=1,\ a_1 = (-1)^{1-1} \cdot 2^1 = (-1)^0 \cdot 2^1 = 1 \cdot 2 = \boxed{2}$

$n=2,\ a_2 = (-1)^{2-1} \cdot 2^2 = (-1)^1 \cdot 4 = -1 \cdot 4 = \boxed{-4}$

$n=5,\ a_5 = (-1)^{5-1} \cdot 2^5 = (-1)^4 \cdot 32 = 1 \cdot 32 = \boxed{32}$

Progression

A progression is a special type of sequence for which it is possible to obtain a formula for the nth term. The Arithmetic Progression is the most commonly used sequence in maths with easy to understand formulas.

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, ---------

Q Is this a sequence?

Ans: Yes.

Arithmetic Progression

An **Arithmetic Progression (AP)** is a sequence of numbers where the differences between every two **consecutive** terms are the same. In this progression, each term, except the first term, is obtained by adding a fixed number to its previous term. This fixed number is known as the common difference and is denoted by 'd'. The first term of an arithmetic progression is usually denoted by 'a' or 'a_1'.

7, 12, 17, 22, 27, 32 . . . 37 . . . . . .

+5 +5 +5 +5 +5 +5

Common difference = d

-6, -2, 2, 6, 10, 14, 18, 22 . . . . . .

+4 +4 +4 +4 +4 +4 +4

Arithmetic Sequence.

A.P

general term ka formula

Types of A.P.

Finite AP: An AP containing a finite number of terms is called finite AP. A finite AP has a last term.

For example: 3, 5, 7, 9, 11, 13, 15, 17, 19, 21

a = 3
d = 2

Infinite AP: An AP which does not have a finite number of terms is called infinite AP. Such APs do not have a last term.

For example: 5, 10, 15, 20, 25, 30, 35, 40, 45 ...

a = 5
d = 5

#Q. Show that the sequence defined by $a_n = 2n^2 + 1$ is not an A.P.

$a_n = 2n^2 + 1$

$n=1,\ a_1 = 2(1)^2 + 1 = 3$

$n=2,\ a_2 = 2(2)^2 + 1 = 9$

$n=3,\ a_3 = 2(3)^2 + 1 = 19$

$n=4,\ a_4 = 2(4)^2 + 1 = 33$

3, 9, 19, 33 .....

+6 +10 +14

∵ there is no common difference, ∴ it is not an A.P.

#Q. The nth term of an A.P. is 6n + 2. Find the common difference.

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$a_n = 6n+2$

$n=1, \quad a_1 = 6(1)+2 = 8$

$n=2, \quad a_2 = 6(2)+2 = 14$

$n=3, \quad a_3 = 6(3)+2 = 20$

$a = a_1$

8, 14, 20 ..... .

$d = a_2 - a_1$

$= 14 - 8$

$d = 6$

#Q. The general term of a sequence is given by $a_n = -4n + 15$. Is the sequence an A.P.? If so, find its 15th term and the common difference.

$a_n = -4n + 15$

$a_1 = -4(1) + 15 = 11$

$a_2 = -4(2) + 15 = 7$

$a_3 = -4(3) + 15 = 3$

$a_4 = -4(4) + 15 = -1$

$a_1, a_2, a_3, a_4 \ldots\ldots$

$11, 7, 3, -1 \ldots\ldots$

Yes it is an A.P. $\therefore d = -4$

$a_2 - a_1 = a_3 - a_2 = a_4 - a_3$

$7 - 11 = 3 - 7 = -1 - 3$

$-4 = -4 = -4$

$a_{15} = -4(15) + 15 = -60 + 15 = -45$

General Term of an A.P.

5, 11, 17, 23, 29, 35 . . . . . .

+6 +6 +6 +6 +6

First term = a.

Common difference = d.

$a, a+d, a+d+d, a+d+d+d, a+d+d+d+d$ . . . . . .

$a, a+d, a+2d, a+3d, a+4d, a+5d, a+6d$ . . . . . .

$a, a+d, a+2d, a+3d, a+4d, a+5d \ldots\ldots\ldots$

$a+0d, a+1d, a+2d, a+3d, a+4d, a+5d \ldots\ldots$

a_1 a_2 a_3 a_4 a_5 a_6

$a_1 = a+0d$
$a_2 = a+1d$
$a_3 = a+2d$
$a_4 = a+3d$

$a_{10} = a+9d$
$a_{11} = a+10d$
$a_{20} = a+19d$
$a_{100} = a+99d$

$a_{498} = a+497d$

$a_n = a+(n-1)d$

general term / n^{th} term.

#Q. Write an A.P. whose first term is 10 and common difference is 3.

$$a_n = a + (n-1)d$$

a_n : nth term.

a : First term.

d : Common d.

$a = 10, d = 3$

10, 13, 16, 19, 22 ----- A.P

#Q. Write an A.P. having 4 as the first term and –3 as the common difference.

5 terms.

$a = 4$

$d = -3$

4, 1, -2, -5, -8 - - - - - - - - -

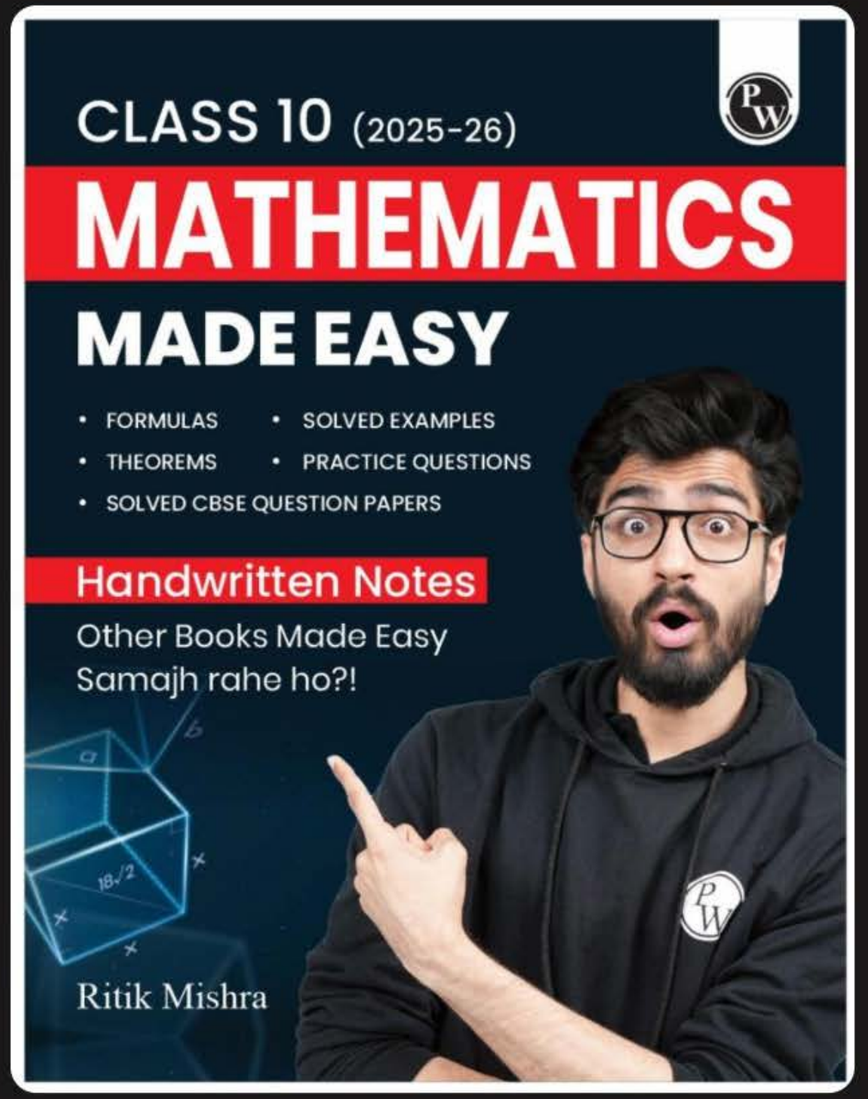
A.P

$a,\ a+d,\ a+2d,\ a+3d$ - - - - -

$4,\ 4+(-3),\ 4+2(-3),\ 4+3(-3)$ - - -

4, 1, -2, -5 - - - —

Available on PW Store, Amazon, Flipkart



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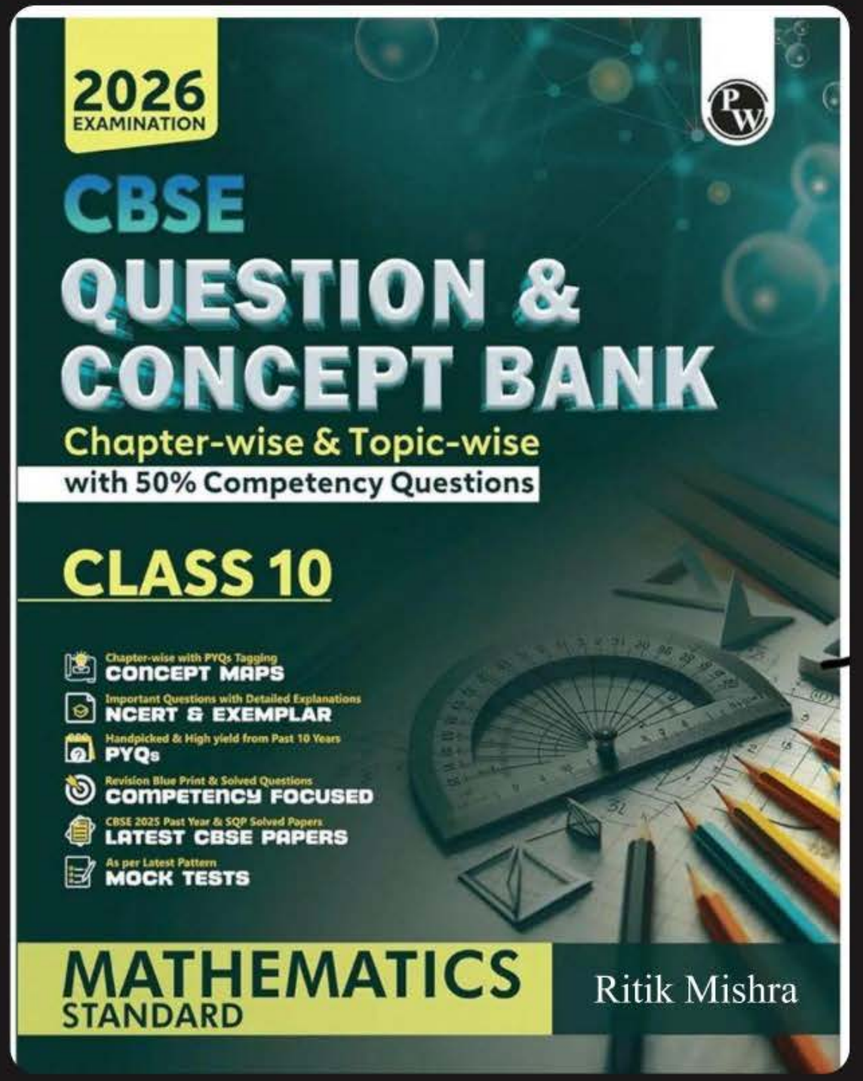

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DREAM BIG
NEVER GIVE UP

RITIK SIR

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Thank You Babuaas❤️🫂

Thank You