DAY 2 (General Term of AP)

In last section, we have discussed about series AP and its difference, here we shall discuss about its general term.

1. **Find 10th term of 2, 7, 12, … … ..**

   Sol :- Given A.P. is 2,7,12, … … ….

   Here $a = 2, d = 7 - 2 = 5$ and $n = 10$

   Now 10^{th}term $= a + 9d = 2 + 9 \times 5 = 2 + 47 = 49$

2. **Find 24th term of 5, 8, 11, … … ..**

   Sol :- Given A.P. is 5,8,11, … … ….

   Here $a = 5, d = 8 - 5 = 3$ and $n = 24$

   Now 24^{th}term $= a + 23d = 5 + 23 \times 3 = 5 + 69 = 74$

3. **Find 18th term of 10, 6, 2, … … ..**

   Sol :- Given A.P. is 10,6,2, … … ….

   Here $a = 10, d = 6 - 10 = -4$ and $n = 18$

   Now 18^{th}term $= a + 17d = 10 + 17 \times (-4) = 10 - 68 = -58$

4. **How many terms are in AP 5, 9, 13, … … … … 197?**

   Sol :- Given A.P. is 5,9,13, … … … . ,197

   Here $a = 5, d = 9 - 5 = 4$ and last term $(l) = 197$

   Since last term$(l)$is considered as n^{th}term

   So $l = a_n = 197$

   $\Rightarrow a + (n-1)d = 197$ $\Rightarrow 5 + (n-1)4 = 197$

   $\Rightarrow 5 + 4n - 4 = 197$ $\Rightarrow 4n + 1 = 197$

   $\Rightarrow 4n = 197 - 1 = 196$ $\Rightarrow n = \frac{196}{4} = 49$

   Hence in given AP, there are 49 terms.

   ALTERNATE METHOD TO SOLVE:

   $\Rightarrow a + (n-1)d = 197$ $\Rightarrow 5 + (n-1)4 = 197$

   $\Rightarrow (n-1)4 = 197 - 5 = 192$ $\Rightarrow (n-1) = \frac{192}{4} = 48$

   $\Rightarrow n = 48 + 1 = 49$

   Hence in given AP, there are 49 terms.

5. **Which term of AP 4, 8, 12, … … … . . is 124?**

Sol :- Given A.P. is 4,8,12, … … ….

Here $a = 4, d = 8 - 4 = 4$ and suppose $n^{th} = 124$

$\Rightarrow a + (n-1)d = 124 \quad \Rightarrow 4 + (n-1)4 = 124$

$\Rightarrow 4 + 4n - 4 = 124 \quad \Rightarrow 4n = 124$

$\Rightarrow n = \frac{124}{4} = 31$

Hence in given AP, there are 31 terms.

ALTERNATE METHOD TO SOLVE:

$\Rightarrow a + (n-1)d = 124 \quad \Rightarrow 4 + (n-1)4 = 124$

$\Rightarrow (n-1)4 = 124 - 4 = 120 \quad \Rightarrow (n-1) = \frac{120}{4} = 30$

$\Rightarrow n = 30 + 1 = 31$

Hence in given AP, there are 31 terms.

6. **Which term of AP 21, 18, 15, … … … . . is – 81?**

Sol :- Given A.P. is 21,18,15, … … ….

Here $a = 21, d = 18 - 21 = -3$ and suppose $n^{th} = -81$

$\Rightarrow a + (n-1)d = -81 \quad \Rightarrow 21 + (n-1)(-3) = -81$

$\Rightarrow 21 - 3n + 3 = -81 \quad \Rightarrow 24 - 3n = -81$

$\Rightarrow -3n = -81 - 24 = -105 \quad \Rightarrow n = \frac{-105}{-3} = 35$

Hence in given AP, there are 35 terms.

ALTERNATE METHOD TO SOLVE:

$\Rightarrow a + (n-1)d = -81 \quad \Rightarrow 21 + (n-1)(-3) = -81$

$\Rightarrow (n-1)(-3) = -81 - 21 = -102 \quad \Rightarrow (n-1) = \frac{-102}{-3} = 34$

$\Rightarrow n = 34 + 1 = 35$

Hence in given AP, there are 35 terms.

EXERCISE

1. Ex. 5.2, Q 1,2,4,5,6
2. Find 10^{th} term of 6,10,14, … … … ..
3. Find 30^{th} term of 7,12,17, … … … ..
4. Find 18^{th} term of 24,18,12, … … … ..
5. How many terms in AP 3,8,13, … … … . .133?
6. Which term of AP 10,13,16, … … … . . is 244?