

* AP Sum of "n" terms of an AP.

Class - Xth
Sub-Mathematics

If For an AP

$$\text{1st term} = a$$

$$\text{Common difference} = d$$

$$\text{Number of terms} = n$$

by Sonu sir

then Sum of 'n' terms of an AP. is

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

Note: For An AP. Sonu sir

$$a, (a+d), (a+2d), \dots, d.$$

When last term = $l_n = l$ given

And no. of terms = n given

$$S_n = \frac{n}{2} [a + l]$$

Example 10

① Find the sum of first 24 terms of the AP →
5, 8, 11, 14, -----

Soln. AP → 5, 8, 11, 14, -----

Here $\boxed{\text{1st term} = a = 5}$

$$c - d = d = t_2 - t_1$$

$$d = 8 - 5$$

$$\boxed{d = 3}$$

Jony Sir

Sum of $\boxed{n = 24}$ terms

$$\therefore S_n = \frac{n}{2} [2a + (n-1)d]$$

$$S_{24} = \frac{24}{2} [2 \times 5 + (24-1) \times 3]$$

$$= 12 \times [10 + 23 \times 3]$$

$$= 12 [10 + 69]$$

$$S_{24} = 12 \times 79$$

$$\boxed{S_{24} = 948}$$

Q Find the sum of all even numbers between 10 and 100. (AP)

Soln Even numbers between 10 and 100 are
 $12 + 14 + 16 + \dots + 98$

Here $a = 12$, $C.d = d = 2$

Sony Sir

And last term = $a_n = l = 98$

$$a + (n-1)d = 98$$

$$12 + (n-1) \times 2 = 98$$

$$(n-1) \times 2 = 98 - 12$$

~~(n-1)~~

$$(n-1) \times 2 = 86$$

$$n-1 = \frac{86}{2}$$

$$n-1 = 43$$

$$n = 43 + 1$$

$$n = 44$$

Sony

Q Find the sum of the following AP
 $(-5) + (-8) + (-11) + \dots + (-230)$

Q. If the sum of the first 14 terms of an AP is 1050 and its first term is 10, find the 20th term.

Q Find the 20th term of the AP whose 7th term is 24 less than the 11th term, if first term is 12.

∴ Sum is

$$\therefore S_n = \frac{n}{2} (1 + a)$$

$$\therefore S_{44} = \frac{44}{2} (98 + 12)$$

$$= 22 \times 110$$

$$= 2420 \text{ A}$$

Q. Find the sum of AP $(-5) + (-8) + (-11) + \dots +$

Soln Here $a = -5$

$$\therefore d = t_2 - t_1$$

$$d = -8 - (-5)$$

$$d = -8 + 5$$

$$d = -3$$

Note

For such type questions

~~Don't~~ Don't ~~at first find~~ "n" ←

And last term = $l = t_n = -230$

$$a + (n-1)d = -230$$

$$-5 + (n-1) \times (-3) = -230$$

$$(n-1) \times (-3) = -230 + 5$$

$$(n-1) \times (-3) = -225$$

$$(n-1) = \frac{-225}{-3}$$

$$n-1 = 75$$

$$n = 75 + 1$$

$$n = 76$$

And Sum

$$S_n = \frac{n}{2} [a+l]$$

$$= \frac{76}{2} \times [-5 + (-230)]$$

$$= 38 \times (-235) = -8930$$

Q. If the sum of the first 14 terms of an AP is 1050 and its first term is 10. Find the 20th term.

Soln. A/c First term = $a = 10$

Let common difference = $c.d = d$.

A/c sum of 14 terms = $S_{14} = 1050$

\therefore sum of n terms = $S_n = \frac{n}{2} [2a + (n-1)d]$

\therefore sum of 14 terms \Rightarrow

$$S_{14} = 1050$$

sum

$$\frac{14}{2} [2a + (14-1)d] = 1050$$

$$\Rightarrow 7 [2 \times 10 + 13d] = 1050$$

$$\Rightarrow 20 + 13d = \frac{1050}{7}$$

$$\Rightarrow 20 + 13d = 150$$

$$\Rightarrow 13d = 150 - 20$$

$$\Rightarrow 13d = 130$$

$$\Rightarrow d = \frac{130}{13}$$

$$\boxed{d = 10}$$

Now

$$20\text{th term} = t_{20} = a + (20-1)d$$

$$t_{20} = 10 + 19 \times 10$$

$$t_{20} = 10 + 190$$

$$\boxed{t_{20} = 200} \text{ An}$$

sum

- Q.N. (1) Find the sum : $25 + 28 + 31 + \dots + 100$
[Ans. 1625]
- Q.N. (2) Find the sum of 26 terms of the AP. $1, 3, 5, 7, \dots$
[Ans. 676]
- Q.N. (3) Find the sum of 18 terms of the AP. $9, 7, 5, 3, \dots$
[Ans. -144]
- Q.N. (4) How many terms of the AP. $3, 5, 7, 9, \dots$
must be added to get the sum 120? [Ans. $n=10$]
- Q.N. (5) Find the sum of all two digit odd positive numbers.
[Ans. 2475]
- Q.N. (6) Find the sum of first 25 terms of an AP. Whose
 n th term is given by $T_n = (7 - 3n)$ [Ans. -800]
- Q.N. (7) Find the sum of first 21 terms of the AP.
Whose 2nd term is 8 and 4th term is 14 [Ans. 735]
- Q.N. (8) Find the sum of all natural numbers lying
between 100 and 500 which are divisible by 8.
[Ans. 15000]

Note. At First Read and Write all
Theory, Formula and Examples (solved) then.
Solve the questions. (By Sonu Sir)