Arithmetic Progressions Ex 9.3 Q4

Answer :

In the given problem, we are given an A.P.

We need to find the number of terms present in it

So here we will find the value of *n* using the formula, $a_n = a + (n-1)d$

(i) Here, A.P is $7, 10, 13, ...43$

The first term (a) = 7

The last term (a_n) = 43

Now,

Common difference (d) = $a_1 - a$

$= 10 - 7$

$= 3$

Thus, using the above mentioned formula, we get,

$$43 = 7 + (n-1)3$$

$$43 - 7 = 3n - 3$$

$$36 + 3 = 3n$$

$$n = \frac{39}{3}$$

$$n = 13$$

Thus, $n = 13$

Therefore, the number of terms present in the given A.P is $\boxed{13}$

(ii) Here, A.P is $-1,-\frac{5}{6},-\frac{2}{3},-\frac{1}{2},....,\frac{10}{3}$

The first term (a) = -1

The last term (a_n) = $\frac{10}{3}$

Now,

Common difference (d) = $a_1 - a$

$$=-\frac{5}{6}-(-1)$$

$$=-\frac{5}{6}+1$$

$$=\frac{-5+6}{6}$$

$$=\frac{1}{6}$$

Thus, using the above mentioned formula, we get,

$$\frac{10}{3}=-1+(n-1)\frac{1}{6}$$

$$\frac{10}{3}+1=\frac{1}{6}n-\frac{1}{6}$$

$$\frac{13}{3}+\frac{1}{6}=\frac{1}{6}n$$

Further solving for n, we get

$$\frac{26+1}{6}=\frac{1}{6}n$$

$$n=\frac{27}{6}(6)$$

$$n=27$$

Thus, $n=27$

Therefore, the number of terms present in the given A.P is $\boxed{27}$

(iii) Here, A.P is $7,13,19,....205$

The first term (a) = 7

The last term (a_n) = 205

Now,

Common difference (d) = a_1-a

$=13-7$

$=6$

Thus, using the above mentioned formula, we get,

$$205=7+(n-1)6$$

$$205-7=6n-6$$

$$198+6=6n$$

$$n=\frac{204}{6}$$

$$n=34$$

Thus, $n=34$

Therefore, the number of terms present in the given A.P is $\boxed{34}$

(iv) Here, A.P is $18, 15\frac{1}{2}, 13, ..., -47$

The first term (a) = 18

The last term (a_n) = -47

Now,

Common difference (d) = $a_1 - a$

$$= 15\frac{1}{2} - 18$$

$$= \frac{31}{2} - 18$$

$$= \frac{31-36}{2}$$

$$= -\frac{5}{2}$$

Thus, using the above mentioned formula, we get,

$$-47 = 18 + (n-1)(-\frac{5}{2})$$

$$-47 - 18 = -\frac{5}{2}n + \frac{5}{2}$$

$$-65 - \frac{5}{2} = -\frac{5}{2}n$$

Further, solving for n, we get

$$\frac{-130-5}{2} = -\frac{5}{2}n$$

$$-\frac{135}{2}(2) = -5n$$

$$n = \frac{-135}{-5}$$

$$n = 27$$

Thus, $n = 27$

Therefore, the number of terms present in the given A.P is $\boxed{27}$.

********** END **********