



Arithmetic Progressions Ex 19.2 Q4

(i) Is 68 a term of A.P 7, 10, 13, ...?

Here, $a = 7$

and $x = 10 - 7 = 3$

$$\begin{aligned}\therefore a_n \text{ term is } &= a + (n - 1)d \\ &= 7 + (n - 1)3\end{aligned}$$

Let 68 be n th term of A.P

Then,

$$\begin{aligned}68 &= 7 + 3(n - 1) \\ \Rightarrow 68 &= 7 + 3n - 3 \\ \Rightarrow 68 - 4 &= 3n \\ \Rightarrow 64 &= 3n \\ \Rightarrow n &= \frac{64}{3}\end{aligned}$$

Which is not a natural number.

\therefore 68 is not a term of given A.P.

(ii) Is 302 a term of A.P 3, 8, 13

Let 302 be n th term of the given A.P

Here, $302 = 3 + (n - 1)5$

$$\begin{aligned}\frac{299}{5} &= (n - 1) \\ n &= \frac{304}{5}\end{aligned}$$

Which is not a natural number.

\therefore 302 is not a term of given A.P.

(i) The given sequence is $24, 23\frac{1}{4}, 22\frac{1}{2}, 21\frac{3}{4}, \dots$

Here, $a = 24$

$$d = 23\frac{1}{4} - 24 = \frac{93 - 96}{4} = \frac{-3}{4}$$

Let n th term be the 1st negative term.

$$a_n < 0$$

$$a + (n - 1)d < 0$$

$$24 - \frac{3}{4}(n - 1) < 0$$

$$96 - 3n + 3 < 0$$

$$99 < 3n$$

$$33 < n \quad \text{or} \quad n > 33$$

\therefore 34th term is 1st negative term.

(ii) The given sequence is $12 + 8i, 11 + 6i, 10 + 4i, \dots$

Here, $a = 12 + 8i$

$$d = -1 - 2i$$

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

$$= 12 + 8i + (n - 1)(-1 - 2i)$$

$$= (13 - n) + i(10 - 2n)$$

Let n th term be purely real the $(10 - 2n) = 0$ or $n = 5$

So, 5th term is purely real.

Let n th term be purely imaginary. Then, $13 - n = 0$

$$\therefore n = 13$$

So, 13th term is purely imaginary.

Arithmetic Progressions Ex 19.2 Q6

(i) The given A.P is 7, 10, 13, ... 43.

Let there be n terms,

then, n term = 43

$$\text{or} \quad 43 = a_n = a + (n - 1)d$$

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

$$\Rightarrow n = 13$$

Thus, there are 13 terms in the given sequence.

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

Let there be n terms

$$\text{then, } n\text{th term} = \frac{10}{3}$$

$$\text{or} \quad \frac{10}{3} = a_n = a + (n - 1)d$$

$$\Rightarrow \frac{10}{3} = -1 + (n - 1)\left(\frac{-5}{6} + 1\right)$$

$$\Rightarrow n = 27$$

Thus, there are 27 terms in the given sequence.

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