



Arithmetic Progressions Ex 19.1 Q1

$a_n = n^2 - n + 1$ ---(i) is the given sequence

Then, first 5 terms are a_1, a_2, a_3, a_4 and a_5

$$a_1 = (1)^2 - 1 + 1 = 1$$

$$a_2 = (2)^2 - 2 + 1 = 3$$

$$a_3 = (3)^2 - 3 + 1 = 7$$

$$a_4 = (4)^2 - 4 + 1 = 13$$

$$a_5 = (5)^2 - 5 + 1 = 21$$

First 5 terms 1, 3, 7, 13 and 21.

Arithmetic Progressions Ex 19.1 Q2

$$a_n = n^3 - 6n^2 + 11n - 6 \quad n \in N.$$

The first three terms are a_1, a_2 and a_3

$$a_1 = (1)^3 - 6(1)^2 + 11(1) - 6 = 0$$

$$a_2 = (2)^3 - 6(2)^2 + 11(2) - 6 = 0$$

$$a_3 = (3)^3 - 6(3)^2 + 11(3) - 6 = 0$$

\therefore The 1st 3 terms are zero.

and

$$\begin{aligned} a_n &= n^3 - 6n^2 + 11n - 6 \\ &= (n-2)^3 - (n-2) \text{ is positive as } n \geq 4 \end{aligned}$$

$\therefore a_n$ is always positive.

Arithmetic Progressions Ex 19.1 Q3

$$a_n = 3a_{n-1} + 2 \text{ for } n > 1$$

$$\therefore a_2 = 3a_{2-1} + 2 = 3a_1 + 2$$

$$= 3(3) + 2 = 11$$

$$[\because a_1 = 3]$$

$$a_3 = 3a_{3-1} + 2 = 3a_2 + 2$$

$$= (11) + 2 = 35$$

$$[\because a_2 = 11]$$

$$a_4 = 3a_{4-1} + 2 = 3a_3 + 2$$

$$= 3(35) + 2 = 107$$

$$[\because a_3 = 35]$$

\therefore The first four terms of A.P are 3, 11, 35, 107.

Arithmetic Progressions Ex 19.1 Q4

$$\begin{aligned}
 \text{(i)} \quad a_1 &= 1, \quad a_n = a_{n-1} + 2, \quad n \geq 2 \\
 a_2 &= a_{2-1} + 2 = a_{1+2} = 3 & [\because a_1 = 1] \\
 a_3 &= a_{3-1} + 2 = a_2 + 2 = 5 & [\because a_2 = 3] \\
 a_4 &= a_{4-1} + 2 = a_3 + 2 = 7 & [\because a_3 = 5] \\
 a_5 &= a_{5-1} + 2 = a_4 + 2 = 9 & [\because a_4 = 7]
 \end{aligned}$$

\therefore The first 5 terms of series are 1, 3, 5, 7, 11.

$$\begin{aligned}
 \text{(ii)} \quad a_1 &= a_2 = 1 \\
 a_n &= a_{n-1} + a_{n-2} \quad n > 2 \\
 \Rightarrow a_3 &= a_{3-1} + a_{3-2} \\
 &= a_2 + a_1 = 1 + 1 = 2 \\
 \Rightarrow a_4 &= a_{4-1} + a_{4-2} \\
 &= a_3 + a_2 = 2 + 1 = 3 \\
 \Rightarrow a_5 &= a_{5-1} + a_{5-2} \\
 &= a_4 + a_3 = 5
 \end{aligned}$$

\therefore The given sequence is 1, 1, 3, 5.

$$\begin{aligned}
 \text{(iii)} \quad a_1 &= a_2 = 2 \\
 a_n &= a_{n-1} - 1 \quad n > 2 \\
 \Rightarrow a_3 &= a_{3-1} - 1 \\
 &= a_2 - 1 \\
 &= 2 - 1 = 1 \\
 \Rightarrow a_4 &= a_{4-1} - 1 \\
 &= a_3 - 1 = 1 - 1 = 0 \\
 \Rightarrow a_5 &= a_{5-1} - 1 \\
 &= 0 - 1 = -1
 \end{aligned}$$

\therefore The first 5 terms of the sequence are 2, 2, 1, 0, -1.

***** END *****