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Arithematic 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.

Arithematic Progressions Ex 19.1 Q2

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

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

$$a_n = n^3 - 6n^2 + 11n - 6$$

$$= (n-2)^3 - (n-2) \text{ is positive as } n \geq 4$$

$\therefore$ a_n is always positive.

Arithematic Progressions Ex 19.1 Q3

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

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

$\qquad\qquad = 3(3) + 2 = 11 \qquad\qquad\qquad\qquad [\therefore a_1 = 3]$

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

$\qquad\qquad = (11) + 2 = 35 \qquad\qquad\qquad\qquad [\therefore a_2 = 11]$

$\qquad a_4 = 3a_{4-1} + 2 = 3a_2 + 2$

$\qquad\qquad = 3(35) + 2 = 107 \qquad\qquad\qquad\quad [\because a_3 = 35]$

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

Arithematic Progressions Ex 19.1 Q4

(i) $a_1 = 1$, $a_n = a_{n-1} + 2$, $n \geq 2$

$a_2 = a_{2-1} + 2 = a_{1+2} = 3$ $[\because a_1 = 1]$

$a_3 = a_{3-1} + 2 = a_2 + 2 = 5$ $[\because a_2 = 3]$

$a_4 = a_{4-1} + 2 = a_3 + 2 = 7$ $[\because a_3 = 5]$

$a_5 = a_{5-1} + 2 = a_4 + 2 = 9$ $[\because a_4 = 7]$

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

(ii) $a_1 = a_2 = 1$

$a_n = a_{n-1} + a_{n-2}$ $n > 2$

$\Rightarrow$ $a_3 = a_{3-1} + a_{3-2}$

$= a_2 + a_1 = 1 + 1 = 2$

$\Rightarrow$ $a_4 = a_{4-1} + a_{4-2}$

$= a_3 + a_2 = 2 + 1 = 3$

$\Rightarrow$ $a_5 = a_{5-1} + a_{5-2}$

$= a_4 + a_3 = 5$

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

(iii) $a_1 = a_2 = 2$

$a_n = a_{n-1} - 1$ $n > 2$

$\Rightarrow$ $a_3 = a_{3-1} - 1$

$= a_2 - 1$

$= 2 - 1 = 1$

$\Rightarrow$ $a_4 = a_{4-1} - 1$

$= a_3 - 1 = 1 - 1 = 0$

$\Rightarrow$ $a_5 = a_{5-1} - 1$

$= 0 - 1 = -1$

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

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