

Exercise 9.1

Write the first terms of each of the following sequences whose n^{th} term are:

(i) $a_n = 3n + 2$

(ii) $a_n = (n - 2)/3$

(iii) $a_n = 3^n$

(iv) $a_n = (3n - 2)/5$

(v) $a_n = (-1)^n \cdot 2^n$

(vi) $a_n = n(n - 2)/2$

(vii) $a_n = n^2 - n + 1$

(viii) $a_n = n^2 - n + 1$

(ix) $a_n = (2n - 3)/6$

Solutions:

(i) $a_n = 3n + 2$

Given sequence whose $a_n = 3n + 2$

To get the first five terms of given sequence, put $n = 1, 2, 3, 4, 5$ and we get

$$a_1 = (3 \times 1) + 2 = 3 + 2 = 5$$

$$a_2 = (3 \times 2) + 2 = 6 + 2 = 8$$

$$a_3 = (3 \times 3) + 2 = 9 + 2 = 11$$

$$a_4 = (3 \times 4) + 2 = 12 + 2 = 14$$

$$a_5 = (3 \times 5) + 2 = 15 + 2 = 17$$

\therefore the required first five terms of the sequence whose n^{th} term, $a_n = 3n + 2$ are 5, 8, 11, 14, 17.

(ii) $a_n = (n - 2)/3$

$$a_n = \frac{n - 2}{3}$$

Given sequence whose

On putting $n = 1, 2, 3, 4, 5$ then can get the first five terms

$$a_1 = \frac{1 - 2}{3} = \frac{-1}{3}; a_2 = \frac{2 - 2}{3} = 0$$

$$a_3 = \frac{3 - 2}{3} = \frac{1}{3}; a_4 = \frac{4 - 2}{3} = \frac{2}{3}$$

$$a_5 = \frac{5 - 2}{3} = 1$$

\therefore the required first five terms of the sequence whose n^{th} term, $a_n = \frac{n - 2}{3}$ are $\frac{-1}{3}, 0, \frac{1}{3}, \frac{2}{3}, 1$.

(iii) $a_n = 3^n$

Given sequence whose $a_n = 3^n$

To get the first five terms of given sequence, put $n = 1, 2, 3, 4, 5$ in the above

$$a_1 = 3^1 = 3;$$

$$a_2 = 3^2 = 9;$$

$$a_3 = 27;$$

$$a_4 = 3^4 = 81;$$

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$$a_5 = 3^5 = 243.$$

∴ the required first five terms of the sequence whose n^{th} term, $a_n = 3^n$ are 3, 9, 27, 81, 243.

(iv) $a_n = (3n - 2)/5$
Given sequence whose $a_n = \frac{3n - 2}{5}$

To get the first five terms of the sequence, put $n = 1, 2, 3, 4, 5$ in the above
And, we get

$$a_1 = \frac{3 \times 1 - 2}{5} = \frac{3 - 2}{5} = \frac{1}{5}$$

$$a_2 = \frac{3 \times 2 - 2}{5} = \frac{6 - 2}{5} = \frac{4}{5}$$

$$a_3 = \frac{3 \times 3 - 2}{5} = \frac{9 - 2}{5} = \frac{7}{5}$$

$$a_4 = \frac{3 \times 4 - 2}{5} = \frac{12 - 2}{5} = \frac{10}{5}$$

$$a_5 = \frac{3 \times 5 - 2}{5} = \frac{15 - 2}{5} = \frac{13}{5}$$

∴ the required first five terms of the sequence are $1/5, 4/5, 7/5, 10/5, 13/5$

(v) $a_n = (-1)^n 2^n$
Given sequence whose $a_n = (-1)^n 2^n$

To get first five terms of the sequence, put $n = 1, 2, 3, 4, 5$ in the above.

$$a_1 = (-1)^1 \cdot 2^1 = (-1) \cdot 2 = -2$$

$$a_2 = (-1)^2 \cdot 2^2 = (-1) \cdot 4 = 4$$

$$a_3 = (-1)^3 \cdot 2^3 = (-1) \cdot 8 = -8$$

$$a_4 = (-1)^4 \cdot 2^4 = (-1) \cdot 16 = 16$$

$$a_5 = (-1)^5 \cdot 2^5 = (-1) \cdot 32 = -32$$

∴ the first five terms of the sequence are $-2, 4, -8, 16, -32$.

(vi) $a_n = n(n - 2)/2$
 $a_n = \frac{n(n - 2)}{2}$

The given sequence is,

To get the first five terms of the sequence, put $n = 1, 2, 3, 4, 5$.

And, we get

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$$a_1 = \frac{1(1-2)}{2} = \frac{1-1}{2} = \frac{-1}{2}$$

$$a_2 = \frac{2(2-2)}{2} = \frac{2 \cdot 0}{2} = 0$$

$$a_3 = \frac{3(3-2)}{2} = \frac{3 \cdot 1}{2} = \frac{3}{2}$$

$$a_4 = \frac{4(4-2)}{2} = \frac{4 \cdot 2}{2} = 4$$

$$a_5 = \frac{5(5-2)}{2} = \frac{5 \cdot 3}{2} = \frac{15}{2}$$

\therefore the required first five terms are $-1/2, 0, 3/2, 4, 15/2$

(vii) $a_n = n^2 - n + 1$

The given sequence whose, $a_n = n^2 - n + 1$

To get the first five terms of given sequence, put $n = 1, 2, 3, 4, 5$.

And, we get

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

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

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

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

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

\therefore the required first five terms of the sequence are 1, 3, 7, 13, 21.

(viii) $a_n = 2n^2 - 3n + 1$

The given sequence whose $a_n = 2n^2 - 3n + 1$

To get the first five terms of the sequence, put $n = 1, 2, 3, 4, 5$.

And, we get

$$a_1 = 2 \cdot 1^2 - 3 \cdot 1 + 1 = 2 - 3 + 1 = 0$$

$$a_2 = 2 \cdot 2^2 - 3 \cdot 2 + 1 = 8 - 6 + 1 = 3$$

$$a_3 = 2 \cdot 3^2 - 3 \cdot 3 + 1 = 18 - 9 + 1 = 10$$

$$a_4 = 2 \cdot 4^2 - 3 \cdot 4 + 1 = 32 - 12 + 1 = 21$$

$$a_5 = 2 \cdot 5^2 - 3 \cdot 5 + 1 = 50 - 15 + 1 = 36$$

\therefore the required first five terms of the sequence are 0, 3, 10, 21, 36.

(ix) $a_n = (2n - 3)/6$

Given sequence whose, $a_n = \frac{2n - 3}{6}$

To get the first five terms of the sequence we put $n = 1, 2, 3, 4, 5$.

And, we get

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$$a_1 = \frac{2.1 - 3}{6} = \frac{2 - 3}{6} = \frac{-1}{6}$$

$$a_2 = \frac{2.2 - 3}{6} = \frac{4 - 3}{6} = \frac{1}{6}$$

$$a_3 = \frac{2.3 - 3}{6} = \frac{6 - 3}{6} = \frac{3}{6} = 1/2$$

$$a_4 = \frac{2.4 - 3}{6} = \frac{8 - 3}{6} = \frac{5}{6}$$

$$a_5 = \frac{2.5 - 3}{6} = \frac{10 - 3}{6} = \frac{7}{6}$$

∴ the required first five terms of the sequence are $-1/6$, $1/6$, $1/2$, $5/6$ and $7/6$



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