Arithmetic Progressions Ex 9.1 Q3

Answer :

In the given problem, we are given the first, second term and the nth term of an A.P.

We need to find its next five terms

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

Here, we are given that $n \geq 2$

So, the next five terms of this A.P would be a_2, a_3, a_4, a_5 and a_6

Now $a_1 = 1$ ...... (1)

So, to find the a_2 term we use $n = 2$, we get,

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

$a_2 = a_1 + 2$

$a_2 = 1 + 2$ (Using 1)

$a_2 = 3$ ...... (2)

For a_3, using $n = 3$, we get,

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

$a_3 = a_2 + 2$

$a_3 = 3 + 2$ (Using 2)

$a_3 = 5$ ...... (3)

For a_4, using $n = 4$, we get,

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

$a_4 = a_3 + 2$

$a_4 = 5 + 2$ (Using 3)

$a_4 = 7$ ...... (4)

For a_5, using $n = 5$, we get,

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

$a_5 = a_4 + 2$

$a_5 = 7 + 2$ (Using 4)

$a_5 = 9$ .... (5)

For a_6, using $n = 6$, we get,

$a_6 = a_{6-1} + 2$

$a_6 = a_5 + 2$

$a_6 = 9 + 2$ (Using 5)

$a_6 = 11$

Therefore, the next five terms, of the given A.P are

$$\boxed{a_2 = 3, a_3 = 5, a_4 = 7, a_5 = 9, a_6 = 11}$$

(ii) $a_1 = a_2 = 2$, $a_n = a_{n-1} - 3$, $n > 2$

Here, we are given that $n > 2$

So, the next five terms of this A.P would be a_3, a_4, a_5, a_6 and a_7

Now $a_1 = a_2 = 2$ ...... (1)

So, to find the a_3 term we use $n = 3$, we get,

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

$a_3 = a_2 - 3$

$a_3 = 2 - 3$ (Using 1)

$a_3 = -1$ ...... (2)

For a_4, using $n = 4$, we get,

$a_4 = a_{4-1} - 3$

$a_4 = a_3 - 3$

$a_4 = -1 - 3$ (Using 2)

$a_4 = -4$ ...... (3)

For a_5, using $n = 5$, we get,

$a_5 = a_{5-1} - 3$

$a_5 = a_4 - 3$

$a_5 = -4 - 3$ (Using 3)

$a_5 = -7$ ...... (4)

For a_6, using $n = 6$, we get,

$a_6 = a_{6-1} - 3$

$a_6 = a_5 - 3$

$a_6 = -7 - 3$ (Using 4)

$a_6 = -10$ ...... (5)

For a_7, using $n = 7$, we get,

$a_7 = a_{7-1} - 3$

$a_7 = a_6 - 3$

$a_7 = -10 - 3$ (Using 5)

$a_7 = -13$

Therefore, the next five terms, of the given A.P are

$a_3 = -1, a_4 = -4, a_5 = -7, a_6 = -10, a_7 = -13$

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