



Arithmetic Progressions Ex 9.2 Q4

Answer :

In the given problem, we need to show that the given sequence is an A.P and then find its common difference.

Here,

$$a_n = 5n - 7$$

Now, to show that it is an A.P, we will find its few terms by substituting $n = 1, 2, 3, 4, 5$

So,

Substituting $n = 1$, we get

$$a_1 = 5(1) - 7$$

$$a_1 = -2$$

Substituting $n = 2$, we get

$$a_2 = 5(2) - 7$$

$$a_2 = 3$$

Substituting $n = 3$, we get

$$a_3 = 5(3) - 7$$

$$a_3 = 8$$

Substituting $n = 4$, we get

$$a_4 = 5(4) - 7$$

$$a_4 = 13$$

Substituting $n = 5$, we get

$$a_5 = 5(5) - 7$$

$$a_5 = 18$$

Further, for the given sequence to be an A.P,

We find the common difference (d)

$$d = a_2 - a_1 = a_3 - a_2$$

Thus,

$$a_2 - a_1 = 3 - (-2)$$

$$= 5$$

Also,

$$a_3 - a_2 = 8 - 3$$

$$= 5$$

Since $a_2 - a_1 = a_3 - a_2$

Hence, the given sequence is an A.P and its common difference is $d = 5$.

Arithmetic Progressions Ex 9.2 Q5

Answer :

In the given problem, we need to show that the given sequence is not an A.P

Here,

$$a_n = 3n^2 - 5$$

Now, first we will find its few terms by substituting $n = 1, 2, 3, 4, 5$

So,

Substituting $n = 1$, we get

$$a_1 = 3(1)^2 - 5$$

$$a_1 = -2$$

Substituting $n = 2$, we get

$$a_2 = 3(2)^2 - 5$$

$$a_2 = 7$$

Substituting $n = 3$, we get

$$a_3 = 3(3)^2 - 5$$

$$a_3 = 22$$

Substituting $n = 4$, we get

$$a_4 = 3(4)^2 - 5$$

$$a_4 = 43$$

Substituting $n = 5$, we get

$$a_5 = 3(5)^2 - 5$$

$$a_5 = 70$$

Further, for the given to sequence to be an A.P,

We find the common difference $(d) = a_2 - a_1 = a_3 - a_2$

Thus,

$$\begin{aligned} a_2 - a_1 &= 7 - (-2) \\ &= 9 \end{aligned}$$

Also,

$$\begin{aligned} a_3 - a_2 &= 22 - 7 \\ &= 15 \end{aligned}$$

So, $a_2 - a_1 \neq a_3 - a_2$

Hence, the given sequence is not an A.P.

Arithmetic Progressions Ex 9.2 Q6

Answer :

In the given problem, we need to find that the given sequence is an A.P or not and then find its 15th term and the common difference.

Here,

$$a_n = -4n + 15$$

Now, to find that it is an A.P or not, we will find its few terms by substituting $n = 1, 2, 3$

So,

Substituting $n = 1$, we get

$$a_1 = -4(1) + 15$$

$$a_1 = 11$$

Substituting $n = 2$, we get

$$a_2 = -4(2) + 15$$

$$a_2 = 7$$

Substituting $n = 3$, we get

$$a_3 = -4(3) + 15$$

$$a_3 = 3$$

Further, for the given to sequence to be an A.P,

We find the common difference $(d) = a_2 - a_1 = a_3 - a_2$

Thus,

$$\begin{aligned} a_2 - a_1 &= 7 - 11 \\ &= -4 \end{aligned}$$

Also,

$$a_3 - a_2 = 3 - 7$$

$$= -4$$

Since $a_2 - a_1 = a_3 - a_2$

Hence, the given sequence is an A.P and its common difference is $d = -4$

Now, to find its 15th using the formula $a_n = a + (n-1)d$

First term (a) = 11

$n = 15$

Common difference (d) = -4

Substituting the above values in the formula

$$a_{15} = 11 + (15 - 1)(-4)$$

$$a_{15} = 11 + (-56)$$

$$a_{15} = -45$$

Therefore, $a_{15} = -45$

***** END *****