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 $\boxed{d = 5}$.

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,

$$a_2 - a_1 = 7 - (-2)$$
$$= 9$$

Also,

$$a_3 - a_2 = 22 - 7$$
$$= 15$$

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 15^{th} 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,

$$a_2 - a_1 = 7 - 11$$
$$= -4$$

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 $\boxed{d = -4}$

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, $\boxed{a_{15} = -45}$

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