Arithmetic Progressions Ex 9.2 Q8
Answer :

In the given problem, we are given the sequence with the n^{th} term (a_n) as $a+nb$ where a and b are real numbers.

We need to show that this sequence is an A.P and then find its common difference (d)

Here,

$a_n = a+nb$

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

So,

Substituting n = 1, we get

$a_1 = a+(1)b$

$a_1 = a+b$

Substituting n = 2, we get

$a_2 = a+(2)b$

$a_2 = a+2b$

Substituting n = 3, we get

$a_3 = a+(3)b$

$a_3 = a+3b$

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

Common difference (d) $= a_2 - a_1 = a_3 - a_2$

Here,

$$a_2 - a_1 = a+2b-a-b$$
$$= b$$

Also,

$$a_3 - a_2 = a+3b-a-2b$$
$$= b$$

Since $a_2 - a_1 = a_3 - a_2$

Hence, the given sequence is an A.P and its common difference is $\boxed{d=b}$.

Arithmetic Progressions Ex 9.2 Q9
Answer :

In the given problem, we are given the sequence with the n^{th} term (a_n).

We need to show that these sequences form an A.P

(i) $a_n = 3+4n$

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

So,

Substituting n = 1, we get

$a_1 = 3+4(1)$

$a_1 = 7$

Substituting n = 2, we get

$a_2 = 3+4(2)$

$a_2 = 11$

Substituting n = 3, we get

$a_3 = 3+4(3)$

$a_3 = 15$

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

Common difference (d) $= a_2 - a_1 = a_3 - a_2$

Here,

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

Also,

$a_3 - a_2 = 15 - 11$
$= 4$

Since $a_2 - a_1 = a_3 - a_2$

Hence, the given sequence is an A.P

(ii) $a_n = 5 + 2n$

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

So,

Substituting *n* = 1, we get

$a_1 = 5 + 2(1)$

$a_1 = 7$

Substituting *n* = 2, we get

$a_2 = 5 + 2(2)$

$a_2 = 9$

Substituting *n* = 3, we get

$a_3 = 5 + 2(3)$

$a_3 = 11$

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

Common difference (*d*) $= a_2 - a_1 = a_3 - a_2$

Here,

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

Also,

$a_3 - a_2 = 11 - 9$
$= 2$

Since $a_2 - a_1 = a_3 - a_2$

Hence, the given sequence is an A.P

(iii) $a_n = 6 - n$

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

So,

Substituting *n* = 1, we get

$a_1 = 6 - 1$

$a_1 = 5$

Substituting *n* = 2, we get

$a_2 = 6 - 2$

$a_2 = 4$

Substituting *n* = 3, we get

$a_3 = 6 - 3$

$a_3 = 3$

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

Common difference (*d*) $= a_2 - a_1 = a_3 - a_2$

Here,

$a_2 - a_1 = 4 - 5$
$= -1$

Also,

$$a_3 - a_2 = 3 - 4$$
$$= -1$$

Since $a_2 - a_1 = a_3 - a_2$

Hence, the given sequence is an A.P

(iv) $a_n = 9 - 5n$

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

So,

Substituting n = 1, we get

$$a_1 = 9 - 5(1)$$
$$a_1 = 4$$

Substituting n = 2, we get

$$a_2 = 9 - 5(2)$$
$$a_2 = -1$$

Substituting n = 3, we get

$$a_3 = 9 - 5(3)$$
$$a_3 = -6$$

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

Common difference (d) $= a_2 - a_1 = a_3 - a_2$

Here,

$$a_2 - a_1 = -1 - 4$$
$$= -5$$

Also,

$$a_3 - a_2 = -6 - (-1)$$
$$= -5$$

Since $a_2 - a_1 = a_3 - a_2$

Hence, the given sequence is an A.P.

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