



Arithmetic Progressions Ex 9.2 Q10

Answer :

In the given problem, we are given various sequences.

We need to find out that the given sequences are an A.P or not and then find its common difference

(d)

(i) 3, 6, 12, 24, ...

Here,

First term (a) = 3

$$a_1 = 6$$

$$a_2 = 12$$

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

$$\text{Common difference } (d) = a_1 - a = a_2 - a_1$$

Here,

$$\begin{aligned} a_1 - a &= 6 - 3 \\ &= 3 \end{aligned}$$

Also,

$$\begin{aligned} a_2 - a_1 &= 12 - 6 \\ &= 6 \end{aligned}$$

Since $a_1 - a \neq a_2 - a_1$

Hence, the given sequence is not an A.P

(ii) 0, -4, -8, -12, ...

Here,

First term (a) = 0

$$a_1 = -4$$

$$a_2 = -8$$

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

$$\text{Common difference } (d) = a_1 - a = a_2 - a_1$$

Here

$$\begin{aligned} a_1 - a &= -4 - 0 \\ &= -4 \end{aligned}$$

Also,

$$\begin{aligned} a_2 - a_1 &= -8 - (-4) \\ &= -4 \end{aligned}$$

Since $a_1 - a = a_2 - a_1$

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

(iii) $\frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \frac{1}{8}, \dots$

Here,

$$\text{First term } (a) = \frac{1}{2}$$

$$a_1 = \frac{1}{4}$$

$$a_2 = \frac{1}{6}$$

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

$$\text{Common difference } (d) = a_1 - a = a_2 - a_1$$

Here,

$$\begin{aligned}a_1 - a &= \frac{1}{4} - \frac{1}{2} \\&= \frac{1-2}{4} \\&= \frac{-1}{4}\end{aligned}$$

Also,

$$\begin{aligned}a_2 - a_1 &= \frac{1}{6} - \frac{1}{4} \\&= \frac{2-3}{12} \\&= \frac{-1}{12}\end{aligned}$$

Since $a_1 - a \neq a_2 - a_1$

Hence, the given sequence is not an A.P

(iv) 12, 2, -8, -18

Here,

First term (a) = 12

$$a_1 = 2$$

$$a_2 = -8$$

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

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

Here,

$$\begin{aligned}a_1 - a &= 2 - 12 \\ &= -10\end{aligned}$$

Also,

$$\begin{aligned}a_2 - a_1 &= -8 - 2 \\ &= -10\end{aligned}$$

Since $a_1 - a = a_2 - a_1$

Hence, the given sequence is an A.P with the common difference $d = -10$

(v) 3,3,3,3,...

Here,

First term (a) = 3

$$a_1 = 3$$

$$a_2 = 3$$

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

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

Here,

$$\begin{aligned}a_1 - a &= 3 - 3 \\ &= 0\end{aligned}$$

Also,

$$\begin{aligned}a_2 - a_1 &= 3 - 3 \\ &= 0\end{aligned}$$

Since $a_1 - a = a_2 - a_1$

Hence, the given sequence is an A.P and its common difference is $d = 0$

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