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,

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

Here,

$a_1 - a = 6 - 3$

$= 3$

Also,

$a_2 - a_1 = 12 - 6$

$= 6$

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,

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

Here

$a_1 - a = -4 - 0$

$= -4$

Also,

$a_2 - a_1 = -8 - (-4)$

$= -4$

Since $a_1 - a = a_2 - a_1$

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

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

Here,

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,

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

Here,

$$a_1 - a = \frac{1}{4} - \frac{1}{2}$$
$$= \frac{1-2}{4}$$
$$= \frac{-1}{4}$$

Also,

$$a_2 - a_1 = \frac{1}{6} - \frac{1}{4}$$
$$= \frac{2-3}{12}$$
$$= \frac{-1}{12}$$

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,

$a_1 - a = 2 - 12$

$= -10$

Also,

$a_2 - a_1 = -8 - 2$

$= -10$

Since $a_1 - a = a_2 - a_1$

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

(v) $3, 3, 3, 3, \ldots$

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,

$a_1 - a = 3 - 3$

$= 0$

Also,

$a_2 - a_1 = 3 - 3$

$= 0$

Since $a_1 - a = a_2 - a_1$

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

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