

Arithmetic Progressions Ex 9.3 Q39

Answer:

Let a be the first term and d be the common difference.

We know that, n^{th} term = $a_n = a + (n - 1)d$

According to the question,

$$a_{19} = 3a_6$$

 $\Rightarrow a + (19 - 1)d = 3(a + (6 - 1)d)$
 $\Rightarrow a + 18d = 3a + 15d$
 $\Rightarrow 18d - 15d = 3a - a$
 $\Rightarrow 3d = 2a$
 $\Rightarrow a = \frac{3}{2}d \dots (1)$

Also,
$$a_9 = 19$$

 $\Rightarrow a + (9 - 1)d = 19$
 $\Rightarrow a + 8d = 19$ (2)

On substituting the values of (1) in (2), we get

$$\frac{3}{2}d + 8d = 19$$

$$\Rightarrow 3d + 16d = 19 \times 2$$

$$\Rightarrow 19d = 38$$

$$\Rightarrow d = 2$$

$$\Rightarrow a = \frac{3}{2} \times 2$$
 [From (1)]

$$\Rightarrow a = 3$$

Thus, the A.P. is 3, 5, 7, 9,

Arithmetic Progressions Ex 9.3 Q40

Answer:

Let a be the first term and d be the common difference.

We know that, n^{th} term = a_n = a + (n - 1)d

According to the question,

$$a_9 = 6a_2$$

 $\Rightarrow a + (9 - 1)d = 6(a + (2 - 1)d)$
 $\Rightarrow a + 8d = 6a + 6d$
 $\Rightarrow 8d - 6d = 6a - a$
 $\Rightarrow 2d = 5a$
 $\Rightarrow a = \frac{2}{5}d \dots (1)$

Also,
$$a_5 = 22$$

 $\Rightarrow a + (5 - 1)d = 22$
 $\Rightarrow a + 4d = 22$ (2)

On substituting the values of (1) in (2), we get

$$\frac{2}{5}d + 4d = 22$$

$$\Rightarrow 2d + 20d = 22 \times 5$$

$$\Rightarrow 22d = 110$$

$$\Rightarrow d = 5$$

$$\Rightarrow a = \frac{2}{5} \times 5 \quad \text{[From (1)]}$$

$$\Rightarrow a = 2$$

Thus, the A.P. is 2, 7, 12, 17,

Arithmetic Progressions Ex 9.3 Q41

Answer:

Let a be the first term and d be the common difference.

We know that, n^{th} term = $a_n = a + (n - 1)d$

According to the question,

$$a_{24} = 2a_{10}$$

 $\Rightarrow a + (24 - 1)d = 2(a + (10 - 1)d)$
 $\Rightarrow a + 23d = 2a + 18d$
 $\Rightarrow 23d - 18d = 2a - a$
 $\Rightarrow 5d = a$
 $\Rightarrow a = 5d \dots (1)$

Also,

$$a_{72} = a + (72 - 1)d$$

= $5d + 71d$ [From (1)]
= $76d$ (2)

and

$$a_{15} = a + (15 - 1)d$$

= $5d + 14d$ [From (1)]
= $19d$ (3)

On comparing (2) and (3), we get

$$76d = 4 \times 19d$$

 $\Rightarrow a_{72} = 4 \times a_{15}$

Thus, 72nd term of the given A.P. is 4 times its 15th term.

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