



### Arithmetic Progressions Ex 9.3 Q17

**Answer :**

In the given problem, we need to find the 32<sup>nd</sup> term of an A.P. which contains a total of 60 terms.

Here we are given the following,

First term ( $a$ ) = 7

Last term ( $a_n$ ) = 125

Number of terms ( $n$ ) = 60

So, let us take the common difference as  $d$

Now, as we know,

$$a_n = a + (n-1)d$$

So, for the last term,

$$125 = 7 + (60-1)d$$

$$125 = 7 + (59)d$$

$$125 - 7 = 59d$$

$$118 = 59d$$

Further simplifying,

$$d = \frac{118}{59}$$

$$d = 2$$

So, for the 32<sup>nd</sup> term ( $n = 32$ )

$$a_{32} = 7 + (32-1)2$$

$$= 7 + (31)2$$

$$= 7 + 62$$

$$= 69$$

Therefore, the 32<sup>nd</sup> term of the given A.P. is **69**.

### Arithmetic Progressions Ex 9.3 Q18

**Answer :**

In the given problem, the sum of 4<sup>th</sup> and 8<sup>th</sup> term is 24 and the sum of 6<sup>th</sup> and 10<sup>th</sup> term is 34.

We can write this as,

$$a_4 + a_8 = 24 \quad \dots\dots(1)$$

$$a_6 + a_{10} = 34 \quad \dots\dots(2)$$

We need to find  $a$  and  $d$

For the given A.P., let us take the first term as  $a$  and the common difference as  $d$

As we know,

$$a_n = a + (n-1)d$$

For 4<sup>th</sup> term ( $n = 4$ ),

$$a_4 = a + (4-1)d$$

$$= a + 3d$$

For 8<sup>th</sup> term ( $n = 8$ ),

$$a_8 = a + (8-1)d$$

$$= a + 7d$$

So, on substituting the above values in (1), we get,

$$(a + 3d) + (a + 7d) = 24$$

$$2a + 10d = 24 \quad \dots\dots(3)$$

Also, for 6<sup>th</sup> term ( $n = 6$ ),

$$a_6 = a + (6-1)d$$

$$= a + 5d$$

For 10<sup>th</sup> term ( $n = 10$ ),

$$a_{10} = a + (10-1)d$$

$$= a + 9d$$

So, on substituting the above values in (2), we get,

$$(a + 5d) + (a + 9d) = 34$$

$$2a + 14d = 34 \quad \dots\dots(4)$$

Next we simplify (3) and (4). On subtracting (3) from (4), we get,

$$(2a + 14d) - (2a + 10d) = 34 - 24$$

$$2a + 14d - 2a - 10d = 10$$

$$4d = 10$$

$$d = \frac{10}{4}$$

$$d = \frac{5}{2}$$

Further, using the value of  $d$  in equation (3), we get,

$$a + 10\left(\frac{5}{2}\right) = 24$$

$$2a + 5(5) = 24$$

$$2a + 25 = 24$$

$$2a = 24 - 25$$

On further simplifying, we get,

$$2a = -1$$

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

Therefore, for the given A.P  $\boxed{a = \frac{-1}{2} \text{ and } d = \frac{5}{2}}$

\*\*\*\*\* END \*\*\*\*\*