Arithmetic Progressions Ex 9.3 Q17

Answer :

In the given problem, we need to find the 32nd 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 32nd term (n = 32)

$$a_{32} = 7 + (32-1)2$$
$$= 7 + (31)2$$
$$= 7 + 62$$
$$= 69$$

Therefore, the 32nd term of the given A.P. is $\boxed{69}$.

Arithmetic Progressions Ex 9.3 Q18

Answer :

In the given problem, the sum of 4th and 8th term is 24 and the sum of 6th and 10th term is 34.
We can write this as,

$$a_4 + a_8 = 24 \quad \ldots\ldots(1)$$
$$a_6 + a_{10} = 34 \quad \ldots\ldots(2)$$

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 4th term (n = 4),

$$a_4 = a + (4-1)d$$
$$= a + 3d$$

For 8th term (n = 8),

$$a_8 = a + (8-1)d$$
$$= a + 7d$$

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

$$(a + 3d) + (a + 7d) = 24$$
$$2a + 10d = 24 \quad \ldots\ldots(3)$$

Also, for 6th term (n = 6),

$$a_6 = a + (6-1)d$$
$$= a + 5d$$

For 10th term (n = 10),

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

$= a + 9d$

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

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

$$2a+14d=34 \qquad .....(4)$$

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 **********