



Arithmetic Progressions Ex 9.3 Q19

**Answer :**

In the given problem, we are given 1<sup>st</sup> and 100<sup>th</sup> term of an A.P.

We need to find the 50<sup>th</sup> term

Here,

$$a = 5$$

$$a_{100} = -292$$

Now, we will find  $d$  using the formula  $a_n = a + (n-1)d$

So,

Also,

$$a_{100} = a + (100-1)d$$

$$-292 = a + 99d$$

So, to solve for  $d$

Substituting  $a = 5$ , we get

$$-292 = 5 + 99d$$

$$-292 - 5 = 99d$$

$$\frac{-297}{99} = d$$

$$d = -3$$

Thus,

$$a = 5$$

$$d = -3$$

$$n = 50$$

Substituting the above values in the formula,  $a_n = a + (n-1)d$

$$a_{50} = 5 + (50-1)(-3)$$

$$a_{50} = 5 - 147$$

$$a_{50} = -142$$

Therefore,  $a_{50} = -142$

Arithmetic Progressions Ex 9.3 Q20

**Answer :**

In this problem, we are given different A.P. and we need to find  $a_{30} - a_{20}$ .

(i) A.P.  $-9, -14, -19, -24, \dots$

Here,

First term ( $a$ ) =  $-9$

Common difference of the A.P. ( $d$ ) =  $-14 - (-9)$

$$= -14 + 9$$

$$= -5$$

Now, as we know,

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

Here, we find  $a_{30}$  and  $a_{20}$

So, for 30<sup>th</sup> term,

$$a_{30} = a + (30-1)d$$

$$= -9 + (29)(-5)$$

$$= -9 - 145$$

$$= -154$$

Also, for 20<sup>th</sup> term,

$$a_{20} = a + (20-1)d$$

$$= -9 + (19)(-5)$$

$$= -9 - 95$$

$$= -104$$

So,

$$\begin{aligned}
 a_{30} - a_{20} &= -154 - (-104) \\
 &= -154 + 104 \\
 &= -50
 \end{aligned}$$

Therefore, for the given A.P.  $a_{30} - a_{20} = -50$

(ii) A.P.  $a, a+d, a+2d, a+3d, \dots$

Here,

First term ( $a$ ) =  $a$

Common difference of the A.P. ( $d$ ) =  $a+d-a=d$

Now, as we know,

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

Here, we find  $a_{30}$  and  $a_{20}$ .

So, for 30<sup>th</sup> term,

$$\begin{aligned}
 a_{30} &= a + (30-1)d \\
 &= a + (29)d
 \end{aligned}$$

Also, for 20<sup>th</sup> term,

$$\begin{aligned}
 a_{20} &= a + (20-1)d \\
 &= a + (19)d
 \end{aligned}$$

So,

$$\begin{aligned}
 a_{30} - a_{20} &= (a + 29d) - (a + 19d) \\
 &= a + 29d - a - 19d \\
 &= 10d
 \end{aligned}$$

Therefore, for the given A.P.  $a_{30} - a_{20} = 10d$

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