



### Arithmetic Progressions Ex 9.3 Q1

**Answer :**

In this problem, we are given different A.P. and we need to find the required term of that A.P.

(i) 10<sup>th</sup> term of the A.P. 1, 4, 7, 10, ...

Here,

First term ( $a$ ) = 1

Common difference of the A.P. ( $d$ ) =  $4 - 1$

= 3

Now, as we know,

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

So, for 10<sup>th</sup> term,

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

$$= 1 + (9)3$$

$$= 1 + 27$$

$$= 28$$

Therefore, the 10<sup>th</sup> term of the given A.P. is  $a_{10} = 28$ .

(ii) 18<sup>th</sup> term of the A.P.  $\sqrt{2}, 3\sqrt{2}, 5\sqrt{2}, \dots$

Here,

First term ( $a$ ) =  $\sqrt{2}$

Common difference of the A.P. ( $d$ ) =  $3\sqrt{2} - \sqrt{2}$

$$= 2\sqrt{2}$$

Now, as we know,

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

So, for 18<sup>th</sup> term,

$$\begin{aligned}a_{18} &= a + (18 - 1)d \\&= \sqrt{2} + (17)2\sqrt{2} \\&= \sqrt{2} + 34\sqrt{2} \\&= 35\sqrt{2}\end{aligned}$$

Therefore, the 18<sup>th</sup> term of the given A.P. is  $a_{18} = 35\sqrt{2}$ .

(iii)  $n^{\text{th}}$  term of the A.P. 13, 8, 3, -2, ...

Here,

First term ( $a$ ) = 13

Common difference of the A.P. ( $d$ ) = 8 - 13

$$= -5$$

Now, as we know,

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

So, for  $n^{\text{th}}$  term,

$$\begin{aligned}a_n &= a + (n - 1)d \\&= 13 + (n - 1)(-5) \\&= 13 + (-5n + 5) \\&= 13 - 5n + 5 \\&= 18 - 5n\end{aligned}$$

Therefore, the  $n^{\text{th}}$  term of the given A.P. is  $a_n = 18 - 5n$ .

(iv) 10<sup>th</sup> term of the A.P.  $-40, -15, 10, 35, \dots$

Here,

First term ( $a$ ) =  $-40$

Common difference of the A.P. ( $d$ ) =  $-15 - (-40)$

$$= -15 + 40$$

$$= 25$$

Now, as we know,

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

So, for 10<sup>th</sup> term,

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

$$= -40 + (9)25$$

$$= -40 + 225$$

$$= 185$$

Therefore, the 10<sup>th</sup> term of the given A.P. is  $a_{10} = 185$

(v) 8<sup>th</sup> term of the A.P.  $117, 104, 91, 78, \dots$

Here,

First term ( $a$ ) =  $117$

Common difference of the A.P. ( $d$ ) =  $104 - 117$

$$= -13$$

Now, as we know,

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

So, for 8<sup>th</sup> term,

$$\begin{aligned}a_8 &= a + (8-1)d \\&= 117 + (7)(-13) \\&= 117 - 91 \\&= 26\end{aligned}$$

Therefore, the 8<sup>th</sup> term of the given A.P. is  $a_8 = 26$ .

(vi) 11<sup>th</sup> term of the A.P. 10.0, 10.5, 11.0, 11.5, ...

Here,

First term ( $a$ ) = 10.0

Common difference of the A.P. ( $d$ ) =  $10.5 - 10.0$   
 $= 0.5$

Now, as we know,

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

So, for 11<sup>th</sup> term,

$$\begin{aligned}a_{11} &= a + (11-1)d \\&= 10.0 + (10)(0.5) \\&= 10.0 + 5.0 \\&= 15.0\end{aligned}$$

Therefore, the 11<sup>th</sup> term of the given A.P. is  $a_{11} = 15.0$ .

(vii) 9<sup>th</sup> term of the A.P.  $\frac{3}{4}, \frac{5}{4}, \frac{7}{4}, \frac{9}{4}, \dots$

Here,

$$\text{First term } (a) = \frac{3}{4}$$

$$\text{Common difference of the A.P. } (d) = \frac{5}{4} - \frac{3}{4}$$

$$= \frac{5-3}{4}$$

$$= \frac{2}{4}$$

Now, as we know,

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

So, for 9<sup>th</sup> term,

$$a_9 = a + (9-1)d$$

$$= \frac{3}{4} + (8)\left(\frac{2}{4}\right)$$

$$= \frac{3}{4} + \frac{16}{4}$$

$$= \frac{19}{4}$$

Therefore, the 9<sup>th</sup> term of the given A.P. is  $a_9 = \frac{19}{4}$ .

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