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^{th} term of the A.P. $1,4,7,10,\ldots$

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^{th} term,

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

$=1+(9)3$

$=1+27$

$=28$

Therefore, the 10^{th} term of the given A.P. is $\boxed{a_{10}=28}$.

(ii) 18^{th} term of the A.P. $\sqrt{2},3\sqrt{2},5\sqrt{2},\ldots$

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 18th term,

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

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

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

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^{th} term,

$$a_n = a + (n-1)d$$
$$= 13 + (n-1)(-5)$$
$$= 13 + (-5n + 5)$$
$$= 13 - 5n + 5$$
$$= 18 - 5n$$

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

(iv) 10th term of the A.P. $-40,-15,10,35,\ldots$

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 10th term,

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

$=-40+(9)25$

$=-40+225$

$=185$

Therefore, the 10th term of the given A.P. is $\boxed{a_{10}=185}$

(v) 8th term of the A.P. $117,104,91,78\ldots$

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 8th term,

$$a_8 = a + (8-1)d$$
$$= 117 + (7)(-13)$$
$$= 117 - 91$$
$$= 26$$

Therefore, the 8th term of the given A.P. is $\boxed{a_8 = 26}$.

(vi) 11th term of the A.P. $10.0, 10.5, 11.0, 11.5, \ldots$

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 11th term,

$$a_{11} = a + (11-1)d$$
$$= 10.0 + (10)(0.5)$$
$$= 10.0 - 5.0$$
$$= 15.0$$

Therefore, the 11th term of the given A.P. is $\boxed{a_{11} = 15.0}$.

(vii) 9th term of the A.P. $\frac{3}{4},\frac{5}{4},\frac{7}{4},\frac{9}{4},\ldots$

Here,

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

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 9th 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 9th term of the given A.P. is $\boxed{a_9 = \frac{19}{4}}$.

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