



## Arithmetic Progressions Ex 9.1 Q2

**Answer :**

Here, we are given the  $n^{\text{th}}$  term for various sequences. We need to find the indicated terms of the A.P.

(i)  $a_n = 5n - 4$

We need to find  $a_{12}$  and  $a_{15}$

Now, to find  $a_{12}$  term we use  $n = 12$ , we get,

$$\begin{aligned} a_{12} &= 5(12) - 4 \\ &= 60 - 4 \\ &= 56 \end{aligned}$$

Also, to find  $a_{15}$  term we use  $n = 15$ , we get,

$$\begin{aligned} a_{15} &= 5(15) - 4 \\ &= 75 - 4 \\ &= 71 \end{aligned}$$

Thus,  $a_{12} = 56$  and  $a_{15} = 71$

(ii)  $a_n = \frac{3n-2}{4n+5}$

We need to find  $a_7$  and  $a_8$

Now, to find  $a_7$  term we use  $n = 7$ , we get,

$$\begin{aligned} a_7 &= \frac{3(7)-2}{4(7)+5} \\ &= \frac{21-2}{28+5} \end{aligned}$$

$$= \frac{19}{33}$$

Also, to find  $a_8$  term we use  $n = 8$ , we get,

$$\begin{aligned} a_8 &= \frac{3(8) - 2}{4(8) + 5} \\ &= \frac{24 - 2}{32 + 5} \\ &= \frac{22}{37} \end{aligned}$$

Thus,  $\boxed{a_7 = \frac{19}{33} \text{ and } a_8 = \frac{22}{37}}$

(iii)  $a_n = n(n-1)(n-2)$

We need to find  $a_5$  and  $a_8$

Now, to find  $a_5$  term we use  $n = 5$ , we get,

$$\begin{aligned} a_5 &= 5(5-1)(5-2) \\ &= 5(4)(3) \\ &= 60 \end{aligned}$$

Also, to find  $a_8$  term we use  $n = 8$ , we get,

$$\begin{aligned} a_8 &= 8(8-1)(8-2) \\ &= 8(7)(6) \\ &= 336 \end{aligned}$$

Thus,  $\boxed{a_5 = 60 \text{ and } a_8 = 336}$

$$(iv) a_n = (n-1)(2-n)(3+n)$$

We need to find  $a_1$ ,  $a_2$  and  $a_3$

Now, to find  $a_1$  term we use  $n = 1$ , we get,

$$\begin{aligned} a_1 &= (1-1)(2-1)(3+1) \\ &= (0)(1)(4) \\ &= 0 \end{aligned}$$

Also, to find  $a_2$  term we use  $n = 2$ , we get,

$$\begin{aligned} a_2 &= (2-1)(2-2)(3+2) \\ &= (1)(0)(5) \\ &= 0 \end{aligned}$$

Similarly, to find  $a_3$  term we use  $n = 3$ , we get,

$$\begin{aligned} a_3 &= (3-1)(2-3)(3+3) \\ &= (2)(-1)(6) \\ &= -12 \end{aligned}$$

Thus,  $\boxed{a_1 = 0, a_2 = 0 \text{ and } a_3 = -12}$

$$(v) a_n = (-1)^n n$$

We need to find  $a_3$ ,  $a_5$  and  $a_8$

Now, to find  $a_3$  term we use  $n = 3$ , we get,

$$\begin{aligned} a_3 &= (-1)^3 3 \\ &= (-1)3 \\ &= -3 \end{aligned}$$

Also, to find  $a_5$  term we use  $n = 5$ , we get,

$$\begin{aligned} a_5 &= (-1)^5 5 \\ &= (-1)5 \\ &= -5 \end{aligned}$$

Similarly, to find  $a_8$  term we use  $n = 8$ , we get,

$$\begin{aligned} a_8 &= (-1)^8 8 \\ &= (1)8 \\ &= 8 \end{aligned}$$

Thus,  $\boxed{a_3 = -3, a_5 = -5 \text{ and } a_8 = 8}$

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