



Arithmetic Progressions Ex 9.1 Q2

Answer :

Here, we are given the n^{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, $\boxed{a_3 = -3, a_5 = -5 \text{ and } a_8 = 8}$

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