



Arithmetic Progressions Ex 9.1 Q1

Answer :

Here, we are given the n^{th} term for various sequences. We need to find the first five terms of the sequence.

(i) $a_n = 3n + 2$

Here, the n^{th} term is given by the above expression. So, to find the first term we use $n = 1$, we get,

$$\begin{aligned} a_1 &= 3(1) + 2 \\ &= 3 + 2 \\ &= 5 \end{aligned}$$

Similarly, we find the other four terms,

Second term ($n = 2$),

$$\begin{aligned} a_2 &= 3(2) + 2 \\ &= 6 + 2 \\ &= 8 \end{aligned}$$

Third term ($n = 3$),

$$\begin{aligned} a_3 &= 3(3) + 2 \\ &= 9 + 2 \\ &= 11 \end{aligned}$$

Fourth term ($n = 4$),

$$\begin{aligned} a_4 &= 3(4) + 2 \\ &= 12 + 2 \\ &= 14 \end{aligned}$$

Fifth term ($n = 5$),

$$\begin{aligned} a_5 &= 3(5) + 2 \\ &= 15 + 2 \\ &= 17 \end{aligned}$$

Therefore, the first five terms for the given sequence are $a_1 = 5, a_2 = 8, a_3 = 11, a_4 = 14, a_5 = 17$.

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

Here, the n^{th} term is given by the above expression. So, to find the first term we use, $n = 1$, we get,

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

Similarly, we find the other four terms,

Second term ($n = 2$),

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

Third term ($n = 3$),

$$a_3 = \frac{(3)-2}{3}$$
$$= \frac{1}{3}$$

Fourth term ($n = 4$),

$$a_4 = \frac{(4)-2}{3}$$
$$= \frac{2}{3}$$

Fifth term ($n = 5$),

$$a_5 = \frac{(5)-2}{3}$$
$$= \frac{3}{3}$$
$$= 1$$

Therefore, the first five terms for the given sequence are $a_1 = \frac{-1}{3}, a_2 = 0, a_3 = \frac{1}{3}, a_4 = \frac{2}{3}, a_5 = 1$.

(iii) $a_n = 3^n$

Here, the n^{th} term is given by the above expression. So, to find the first term we use $n = 1$, we get,

$$a_1 = 3^{(1)}$$
$$= 3$$

Similarly, we find the other four terms,

Second term ($n = 2$),

$$a_2 = 3^{(2)}$$
$$= (3)(3)$$
$$= 9$$

Third term ($n = 3$),

$$a_3 = 3^{(3)}$$
$$= (3)(3)(3)$$
$$= 27$$

Fourth term ($n = 4$),

$$a_4 = 3^{(4)}$$
$$= (3)(3)(3)(3)$$
$$= 81$$

Fifth term ($n = 5$),

$$a_5 = 3^{(5)}$$
$$= (3)(3)(3)(3)(3)$$
$$= 243$$

Therefore, the first five terms for the given sequence are $a_1 = 3, a_2 = 9, a_3 = 27, a_4 = 81, a_5 = 243$.

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