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,

$$a_1 = 3(1) + 2$$
$$= 3 + 2$$
$$= 5$$

Similarly, we find the other four terms,

Second term ($n = 2$),

$$a_2 = 3(2) + 2$$
$$= 6 + 2$$
$$= 8$$

Third term $(n = 3)$,

$$a_3 = 3(3) + 2$$
$$= 9 + 2$$
$$= 11$$

Fourth term $(n = 4)$,

$$a_4 = 3(4) + 2$$
$$= 12 + 2$$
$$= 14$$

Fifth term $(n = 5)$,

$$a_5 = 3(5) + 2$$
$$= 15 + 2$$
$$= 17$$

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

(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,

$$a_1 = \frac{(1)-2}{3}$$
$$= \frac{-1}{3}$$

Similarly, we find the other four terms,

Second term ($n = 2$),

$$a_2 = \frac{(2)-2}{3}$$
$$= \frac{0}{3}$$
$$= 0$$

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 $\boxed{a_1=\frac{-1}{3}, a_2=0, a_3=\frac{1}{3}, a_4=\frac{2}{3}, a_5=1}$.

(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 $\boxed{a_1=3, a_2=9, a_3=27, a_4=81, a_5=243}$.

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