

Assignments:

(i) Write the first five terms:

$$(a) a_n = \frac{2n - 3}{6}$$

$$(b) a_n = (-1)^{n+1} 5^{n+1}$$

Ans) We need to find first five terms

a) i.e. a_1, a_2, a_3, a_4, a_5

$$a_n = \frac{2n-3}{6} \quad \dots(1)$$

Putting $n = 1$ in (1)

$$\begin{aligned} a_1 &= \frac{2 \times 1 - 3}{6} \\ &= \frac{2 - 3}{6} \\ &= \frac{-1}{6} \end{aligned}$$

Putting $n = 2$ in (1)

$$\begin{aligned} a_2 &= \frac{2 \times 2 - 3}{6} \\ &= \frac{4 - 3}{6} \\ &= \frac{1}{6} \end{aligned}$$

Putting $n = 3$ in (1)

$$\begin{aligned} a_3 &= \frac{2 \times 3 - 3}{6} \\ &= \frac{6 - 3}{6} \\ &= \frac{3}{6} \\ &= \frac{1}{2} \end{aligned}$$

Putting $n = 4$ in (1)

$$\begin{aligned}a_4 &= \frac{2 \times 4 - 3}{6} \\&= \frac{8 - 3}{6} \\&= \frac{5}{6}\end{aligned}$$

Putting $n = 5$ in (1)

$$\begin{aligned}a_5 &= \frac{2 \times 5 - 3}{6} \\&= \frac{10 - 3}{6} \\&= \frac{7}{6}\end{aligned}$$

Hence first five terms are $\frac{-1}{6}, \frac{1}{6}, \frac{1}{2}, \frac{5}{6}$, and $\frac{7}{6}$

Ans) We need to find first five terms

b) i.e. a_1, a_2, a_3, a_4, a_5

$$\text{Let } a_n = (-1)^{n-1} 5^{n+1} \quad \dots(1)$$

Putting $n = 1$ in (1)

$$\begin{aligned} a_1 &= (-1)^{1-1} 5^{1+1} \\ &= (-1)^0 \times 5^2 \\ &= 1 \times 5^2 \\ &= 5 \times 5 \\ &= 25 \end{aligned}$$

Putting $n = 2$ in (1)

$$\begin{aligned}a_2 &= (-1)^{2-1} 5^{2+1} \\&= (-1)^1 \times 5^3 \\&= (-1) \times (5 \times 5 \times 5) \\&= -1(125) \\&= -125\end{aligned}$$

Putting $n = 3$ in (1)

$$\begin{aligned}a_3 &= (-1)^{3-1} 5^{3+1} \\&= (-1)^2 \times 5^4 \\&= 1 \times 5^4 \\&= (5 \times 5 \times 5 \times 5) \\&= 625\end{aligned}$$

Putting $n = 4$ in (1)

$$\begin{aligned}a_4 &= (-1)^{4-1} 5^{4+1} \\&= (-1)^3 (5)^5 \\&= (-1)(5)^5 \\&= (-1) (5 \times 5 \times 5 \times 5 \times 5) \\&= -1(3125) \\&= -3125\end{aligned}$$

Putting $n = 5$ in (1)

$$\begin{aligned}a_5 &= (-1)^{5-1} 5^{5+1} \\&= (-1)^4 (5)^6 \\&= 1 \times 5^6 \\&= 1 (5 \times 5 \times 5 \times 5 \times 5 \times 5) \\&= 15625\end{aligned}$$

Hence first five terms are

25, -125, 625, -3125, and 15625.

(ii) Write the first five terms of the AP

$$a_3 = 43, a_6 = 76$$

Answer:

The AP is 21,32,43..... and 10th term 120

Step-by-step explanation:

$$a_3 = 43$$

$$a_3 = a + (3-1)d = a + 2d = 43 \quad \text{---(1)}$$

$$a_6 = 76$$

$$a_6 = a + (6-1)d = a + 5d = 76 \quad \text{---(2)}$$

From (1) and (2), By elimination method,
(2)-(1),

$$3d = 33$$

$$d = 11$$

From (1) $a + 2d = 43$

$$a + 2 \times 11 = 43$$

$$a = 21$$

The Ap is $a, a+d, a+2d, a+3d, \dots$

that is, $21, 21+11, 21+2 \times 11, 21+3 \times 11, \dots$

$21, 32, 43, \dots$

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

$$= 21 + 9 \times 11$$

$$= 120$$