DSSSB TGT PART(A+B)

MATHS

ARITHMETIC PROGRESSION

LIVE STREAMING 16/04/2024 04:00PM

Progression (श्रेणी) → when some no. are arranged in a sequence under a special rule.

जब कुछ संख्याएँ एक विशेष नियम के अन्तर्गत व्यवस्थित की गई हो।

1, 10, 9, 5, 11, 31

i) 5, 10, 15, 20, 25, 30 ----

ii) 5, 3, 1, -1, -3, -5, -7, ------

iii) 1, 2, 4, 8, 16, 32, 64 -------

Arithmetic Progression (समान्तर श्रेणी) →

2, 4, 6, 8, 10, 12, 14, 16 ... ... 50.

(2 → 2, 4 → 2, 14 → 2, 16)

First term (प्रथम पद) ⇒ $a = 2$

Common difference (d) ⇒ $T_n - T_{n-1}$ ⇒ Same (सार्वान्तर)

$$T_n = a + (n-1) \cdot d$$

$$T_{12} = 2 + (12-1) \times 2$$

$$\Rightarrow 2 + 22 \Rightarrow 24$$

$-30, -25, -20, -15, -10, -5, \underline{0}, 5, 10, 15, 20, \underline{25}, \ldots\ldots, 50.$

$-25-(-30)$

$= 5$

इस श्रेणी का 12 वाँ पद क्या होगा?

$a = -30$

$d = 5$

$T_{12} = -30 + (12-1) \cdot 5$

$= -30 + 55$

$= +25$ Ans.

Last

$T_n = a + (n-1) \cdot d$

$L = a + (n-1) \cdot d$

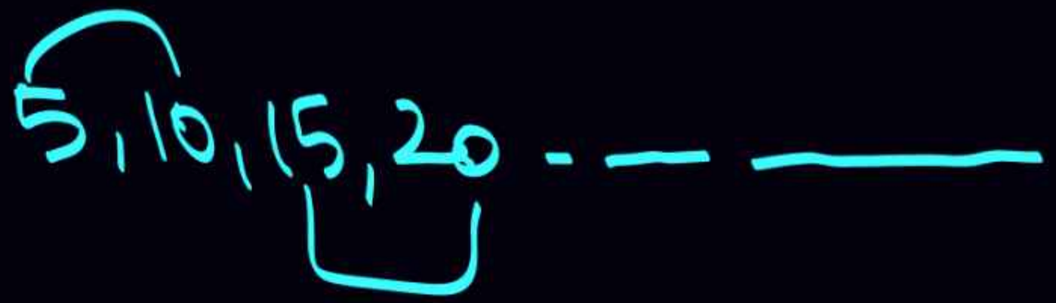
1, 2, 3, 4, 5, 6, 7, 8, 9

Sum of Arithmetic Progression →

$$S_n = \frac{n}{2}\left(2a + (n-1)\cdot d\right)$$

$$S_n = \frac{n}{2}\left(a + \overbrace{a + (n-1)\cdot d}\right)$$

$$S_n = \frac{n}{2}(a + l)$$



$$20 - 15 = 10 - 5$$

$$5 = 5$$

1. $A.P.$ का सामान्य अंतर $\frac{1}{2q}, \frac{1-2q}{2q}, \frac{1-4q}{2q}$ ..... है।

The common difference of the A.P. is $\frac{1}{2q}, \frac{1-2q}{2q}, \frac{1-4q}{2q}$ .....is.

(a) -1

(b) 1

(c) q

(d) 2q

$$\frac{1-4q}{2q} - \frac{1-2q}{2q}$$

$$= \frac{1-4q-1+2q}{2q} \Rightarrow \frac{-2q}{2q} \Rightarrow -1$$

2. $A.P.\ \frac{1}{3}, \frac{1-3b}{3}, \frac{1-6b}{3}$ ..... का सामान्य अंतर है

The common difference of the A.P. $\frac{1}{3}, \frac{1-3b}{3}, \frac{1-6b}{3}$..... is

(a) $\frac{1}{3}$

(b) $-\frac{1}{3}$

(c) -b

(d) b

$d = T_n - T_{n-1}$

$\frac{1-3b-1}{3}$

$\frac{-3b}{3} = -b$

3. $A.P.\ \frac{1}{2b}, \frac{1-6b}{2b}, \frac{1-12b}{2b}, \ldots\ldots$ का सामान्य अंतर है।

The common difference of the A.P. $\frac{1}{2b}, \frac{1-6b}{2b}, \frac{1-12b}{2b}, \ldots\ldots$ **is.**

(a) 2b

(b) -2b

(c) 3

(d) -3

$$\frac{1-6b-1}{2b}$$

$$\frac{-6b}{2b} = -3$$

4. यदि k, 2k - 1 और 2k + 1 किसी AP के लगातार तीन पद हैं, तो k का मान है

If k, 2k - 1 and 2k + 1 are three consecutive terms of an AP, the value of k is

(a) -2

(b) 3

(c) -3

(d) 6

$2k+1-(2k-1) = (2k-1)-k$

$2k+1-2k+1 = 2k-1-k$

$2 = k-1$

$3 = k$

5. $A.P.$ का अगला पद $\sqrt{7}, \sqrt{28}, \sqrt{63}, ...$

The next term of the A.P. $\sqrt{7}, \sqrt{28}, \sqrt{63}, ...$

(a) $\sqrt{70}$

(b) $\sqrt{84}$

(c) $\sqrt{97}$

(d) $\sqrt{112}$

$\sqrt{7}, \sqrt{2\times2\times7}, \sqrt{3\times3\times7}$

$\sqrt{7}, 2\sqrt{7}, 3\sqrt{7}, 4\sqrt{7}$

$2\sqrt{7}-\sqrt{7}$

$\sqrt{7}$

$\sqrt{7}$

$\sqrt{4\times4\times7}$

$\sqrt{112}$

6. किसी A.P. के पहले तीन पद क्रमशः 3y - 1, 3y + 5 और 5y + 1 हैं, फिर, y बराबर है

The first three terms of an A.P. respectively are 3y - 1 , 3y + 5 and 5y + 1 Then, y equals

(a) -3

(b) 4

(c) 5

(d) 2

$d = d$

$3y-1,\ 3y+5,\ 5y+1$

$5y+1-(3y+5) = 3y+5-(3y-1)$

$5y+1-3y-5 = 3y+5-3y+1$

$2y-4 = +6$

$2y = 10$

$y = 5$

a b c

2, 4, 6

$2b = a+c$

a = c

7. यदि $\frac{1}{x+2}, \frac{1}{x+3}, \frac{1}{x+5}$ AP में हैं, तो $x =$

If $\frac{1}{x+2}, \frac{1}{x+3}, \frac{1}{x+5}$ are in A.P. Then, $x =$

(a) 5

(b) 3

(c) 1

(d) 2

$$\frac{1}{x+5} - \frac{1}{x+3} = \frac{1}{x+3} - \frac{1}{x+2}$$

$$\frac{x+3-x-5}{(x+3)(x+5)} = \frac{x+2-x-3}{(x+2)(x+3)}$$

$$\frac{-2}{x+5} = \frac{-1}{x+2}$$

$$-2x-4 = -x-5$$

$$-2x+x = -5+4$$

$$-x = -1$$

$$x = 1$$

$2b = a+c$

$$2\left(\frac{1}{x+3}\right) = \frac{1}{x+2} + \frac{1}{x+5}$$

$$\frac{2}{x+3} = \frac{(x+5)+(x+2)}{(x+2)(x+5)}$$

$$2x^2+14x+20 = 2x^2+7x+6x+21$$

$$x = 1$$

$a = 3,\ d = 5$

$$S_n = \frac{n}{2}(2a + (n-1)\cdot d)$$

8. किसी A.P. का nवाँ पद, जिसके n पदों का योग S_n है, है।

The n^{th} term of an A.P., the sum of whose n terms is S_n is

(a) $S_n + S_{n-1}$

(b) $S_n - S_{n-1}$

(c) $S_n + S_{n+1}$

(d) $S_n - S_{n+1}$

Imp.

$$T_n = S_n - S_{n-1}$$

$$T_n = S_n - S_{(n-1)}$$

$$T_n = a + (n-1)\cdot d$$

$$T_{11} \Rightarrow 30 + (11-1)\cdot(-4)$$

$$30 - 40 \Rightarrow -10$$

1 2 3 4 5 6 7 8 9 10 11

30, 26, 22, 18, 14, 10, 6, 2, -2, -6, -10

$a = 30$, $d = 26 - 30 \Rightarrow -4$

$T_{11} = ?$

$$T_{11} = S_{11} - S_{10}$$

$$\Rightarrow \frac{11}{2}\left(2\times 30 + (11-1)\cdot(-4)\right) - \frac{10}{2}\left(2\times 30 + (10-1)\cdot(-4)\right)$$

$$\Rightarrow \frac{11}{2}(60-40) - 5(60-36)$$

$$\Rightarrow 110 - 120 \Rightarrow -10$$