

Q:- $30, 27, 24, 21, 18 \dots$ का महत्तम योगफल ज्ञात कीजिए।

(Find the maximum sum of the 'A.P. $30, 27, 24, 21, 18 \dots$)

$$a = 30 \quad d = 27 - 30 = -3$$

$$T_n \geq 0$$

$$a + (n-1)d \geq 0$$

$$30 + (n-1)(-3) \geq 0$$

$$30 - 3n + 3 \geq 0$$

$$33 - 3n \geq 0$$

$$+3n \leq 33$$

$$n = \frac{33}{3} = 11$$

$$n = 11$$

Maximum sum $n = 11$ $a = 30, d = -3$

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

$$= \frac{11}{2} [2 \times 30 + (11-1)(-3)]$$

$$= \frac{11}{2} [60 + 10 \times -3]$$

$$= \frac{11}{2} [60 - 30]$$

$$= \frac{11}{2} \times 30 = 165$$

Q:- श्रृंखला 18, 16, 14, --- में पदों की संख्या क्या होगी यदि इसका योग 78 है?

(What is the number of term in the progression 18, 16, 14, --- if its sum is 78?)

$$a = 18 \quad d = 16 - 18 = -2 \quad S_n = 78 \quad n = ?$$

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

$$78 = \frac{n}{2} [2 \times 18 + (n-1) \cdot -2]$$

$$156 = \frac{n}{1} [36 - 2n + 2]$$

$$156 = n [38 - 2n]$$

$$156 = 38n - 2n^2$$

$$2n^2 - 38n + 156 = 0$$

$$2(n^2 - 19n + 78) = 0$$

$$n^2 - 19n + 78 = 0$$

$$n^2 - 13n - 6n + 78 = 0$$

$$n(n-13) - 6(n-13) = 0$$

$$(n-6)(n-13) = 0$$

$$n = 6 / 13$$

Q X को एम निकालिए (solve for X):

$$5 + 7 + 9 + \dots + x = 480$$

$$a = 5 \quad d = 7 - 5 = 2 \quad S_n = 480 \quad n = ?$$

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

$$480 = \frac{n}{2} [2 \times 5 + (n-1)2]$$

$$960 = n [10 + 2n - 2]$$

$$960 = n [8 + 2n]$$

$$960 = 8n + 2n^2$$

$$2n^2 - 8n + 960 = 0$$

$$-2(n^2 + 4n - 480) = 0$$

$$n^2 + 4n - 480 = 0$$

$$n^2 + 24n - 20n - 480$$

$$n(n + 24) - 20(n + 24) = 0$$

$$(n - 20)(n + 24) = 0$$

Write your name or any mark of identification in any part of your answer Book. For Writing an answer

$$n = 20 \quad | \quad -24$$

~~Case-VII~~

Q:- 204 terms, first term is 1, last term is 204, find the sum of the series.

(Find common difference of an A.P. If first term is 1, last term is 204 and the sum of the series is 204.)

$$a=1 \quad l=50 \quad S_n=204$$

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

$$50 = 1 + (n-1)d$$

$$50 - 1 = (n-1)d$$

$$49 = (n-1)d \quad \text{--- (i)}$$

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

$$204 = \frac{n}{2} [2 \times 1 + 49]$$

$$408 = n [2 + 49]$$

$$408 = n \times 51$$

$$\frac{408}{51} = n$$

$$n = 8$$

$n=8$ का मान सभी (i) में रखने

$$49 = (n-1)d$$

$$49 = (8-1)d$$

$$49 = 7d$$

$$\frac{49}{7} = d$$

$$d = 7$$

$$T_3 = 18$$

$$a + 2d = 18 \quad \text{--- (i)}$$

$$T_7 = 30$$

$$a + 6d = 30 \quad \text{--- (ii)}$$

समी. (ii) में समी. (i) का मान रखने पर,
घटाने पर,

$$a + 6d = 30$$

$$a + 2d = 18$$

$$4d = 12$$

$$d = \frac{12}{4} = 3$$

$d = 3$ का मान समी. (i) में रखने पर,

$$a + 2d = 18$$

$$a + 2 \times 3 = 18$$

$$a = 18 - 6$$

$$= 12$$

17 पदों का योग,

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

$$= \frac{17}{2} [2 \times 12 + (17-1) \times 3]$$

$$= \frac{17}{2} [24 + 16 \times 3]$$