

《《《 CDS/CAPF 》》》

VIRAAAT 2.0

2024

Number System

Part 05

Mathematics

Lecture - 05

By – Pramod Yadav Sir



TOPICS *to be covered*

1 Examining question

2 AP, GP, HP

3 - Question

4

QUESTION



How many number from 100–300 are divisible by 3 or 8?

100–300 तक ऐसी कितनी संख्याएँ हैं, 3 या 8 से विभाजित है?

A 84

B 74

C 62

D 54

1–300
100
37
12
÷3
÷8
÷24

1–99

33

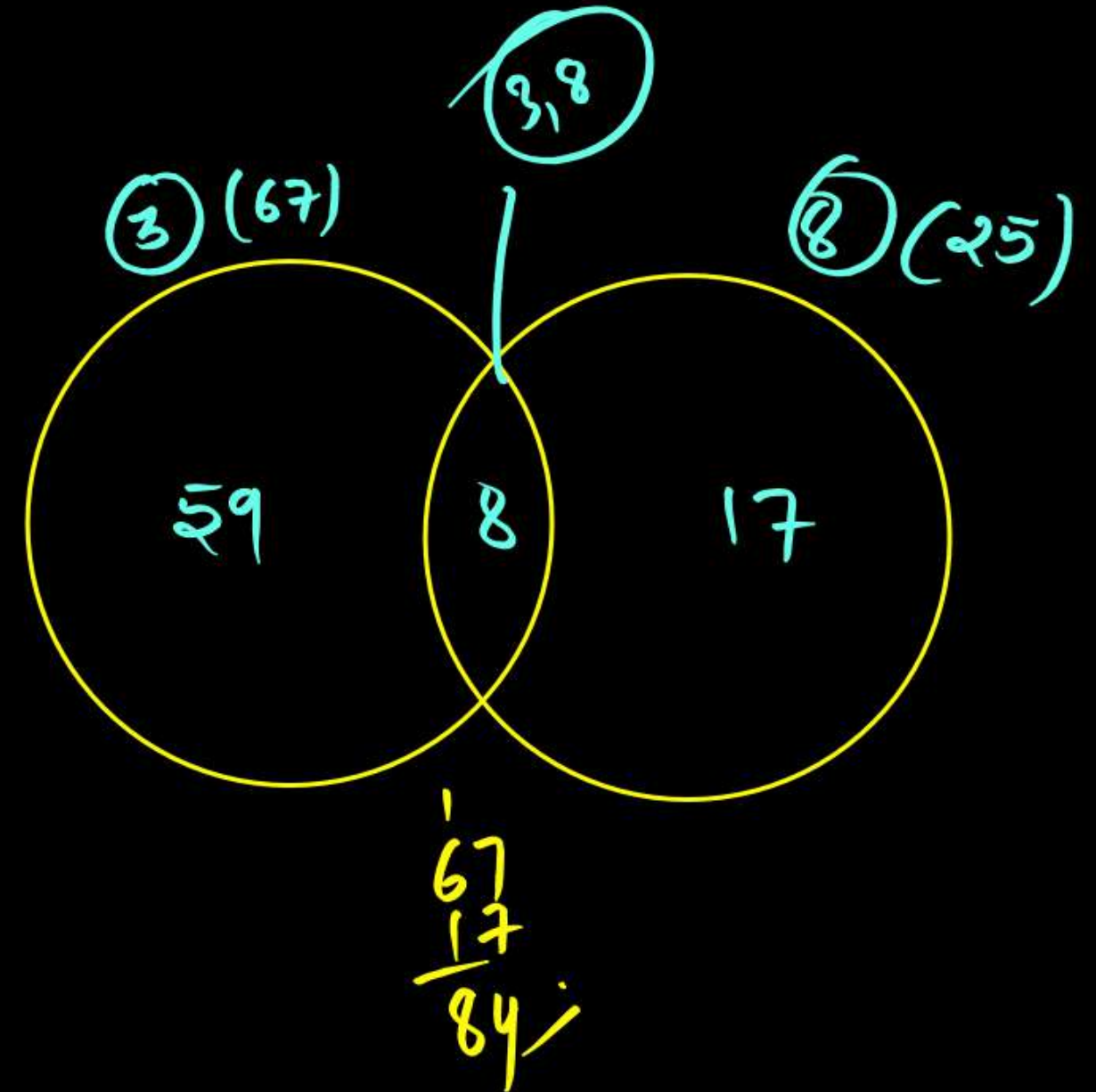
12

4

67

25

8



QUESTION

How many natural numbers less than 1000 are divisible by 5 or 7 but not by 35?

1000 से कम कितनी प्राकृतिक संख्याएँ हैं, जो 5 या 7 से विभाज्य हैं, लेकिन 35 से नहीं?

How

A 285

B 313

C 341

D 243

QUESTION



How many no. from 1 to 600 that are divisible by 3 or 4 or 5?

1 से 600 तक कितनी संख्याएँ हैं, जो 3 या 4 या 5 से भाज्य हैं?

600

$\div 3$ 200

$\div 4$ 150

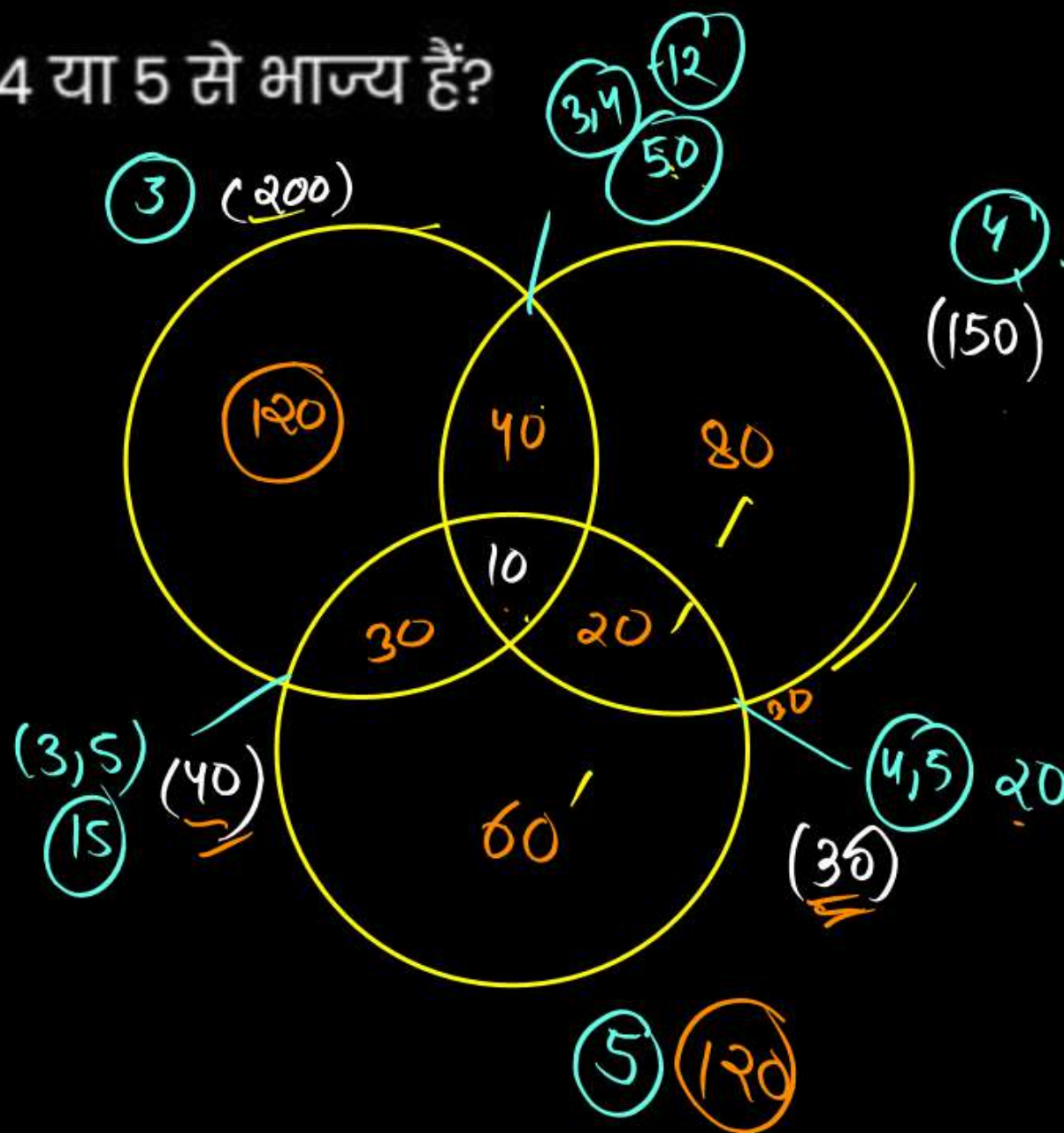
$\div 5$ 120

$\div 12$ 50

$\div 20$ 30

$\div 15$ 40

$\div 60$ 10



$$\begin{array}{r} 200 \\ + 160 \\ \hline 360 \\ \hline \end{array}$$

120
40
10
30
20
80
60

A 200

B 360

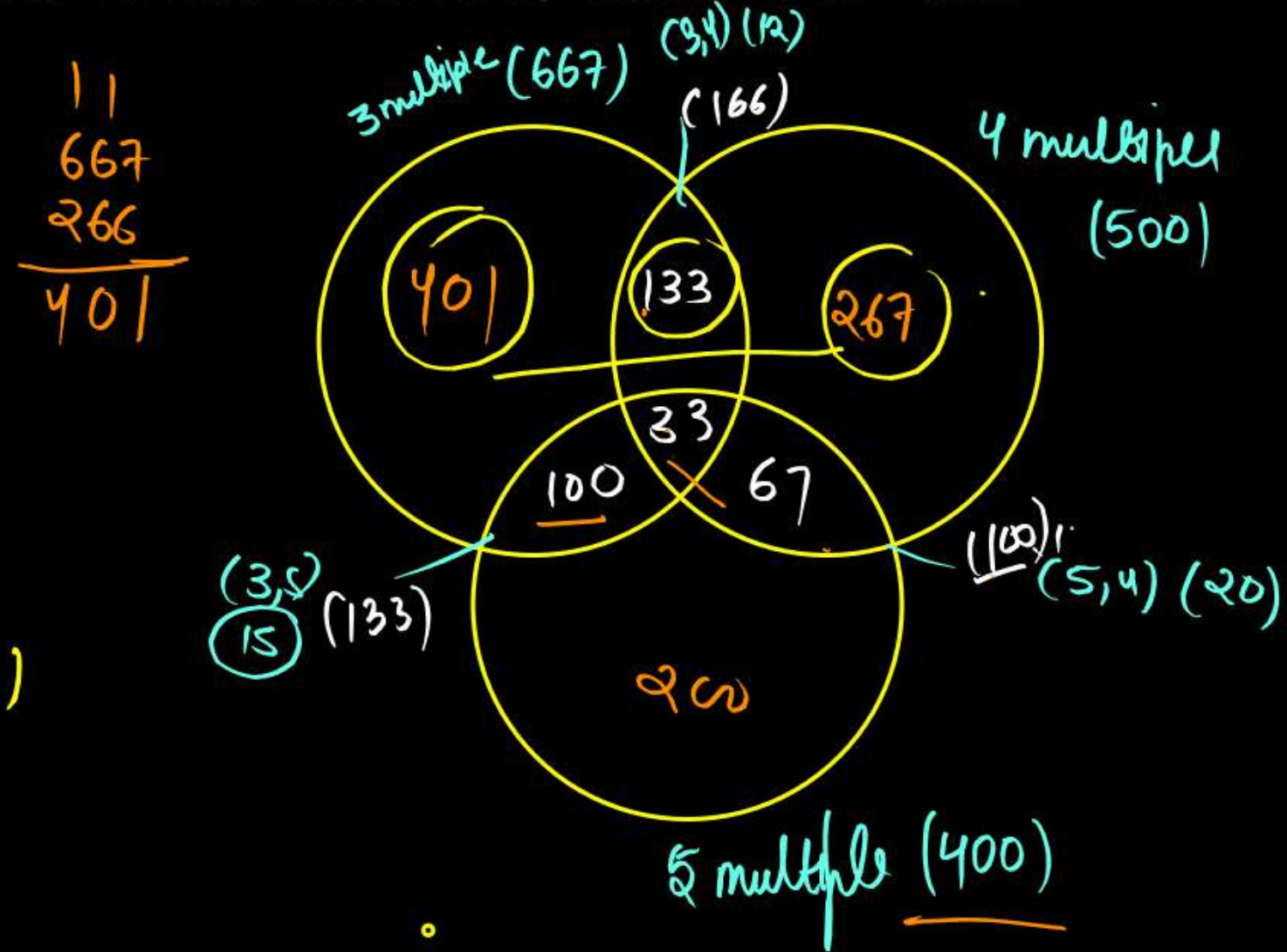
C 400

D 365

How many natural numbers up to 2001 are divisible by 3 or 4 but not 5?

2001 तक कितनी प्राकृतिक संख्याएँ 3 या 4 से विभाज्य हैं, लेकिन 5 से नहीं?

	Number	Divisor	Quotient
A	768	3	256
B	801	4	200.25
C	934	5	186.8
D	1067	12	88.9167



$$\begin{array}{r} 49 \\ 590 \\ 233 \\ \hline 267 \end{array}$$

QUESTION



from

How many numbers between 1 and 300 which are not divisible by 3 or 5?

1 से 300 तक ऐसी कितनी संख्याएँ हैं, जो 3 और 5 से विभाजित ना हों?

A 200

B 160

C 100

D 200

$$300 \left(1 - \frac{1}{3}\right) \left(1 - \frac{1}{5}\right)$$

$$= 300 \times \frac{2}{3} \times \frac{4}{5}$$

$$= 160$$

$$\begin{array}{cccccccccc} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ \hline & \downarrow & & & & & & & \\ & (1 - \frac{1}{3}) & & & & & & & \end{array}$$

1.6 ARITHMETIC PROGRESSION (AP)

An arithmetic progression, or AP, is a sequence where each new term after the first term is obtained by adding a constant d , known as common difference, to the preceding term. If the first term of the sequence is a then the arithmetic progression is

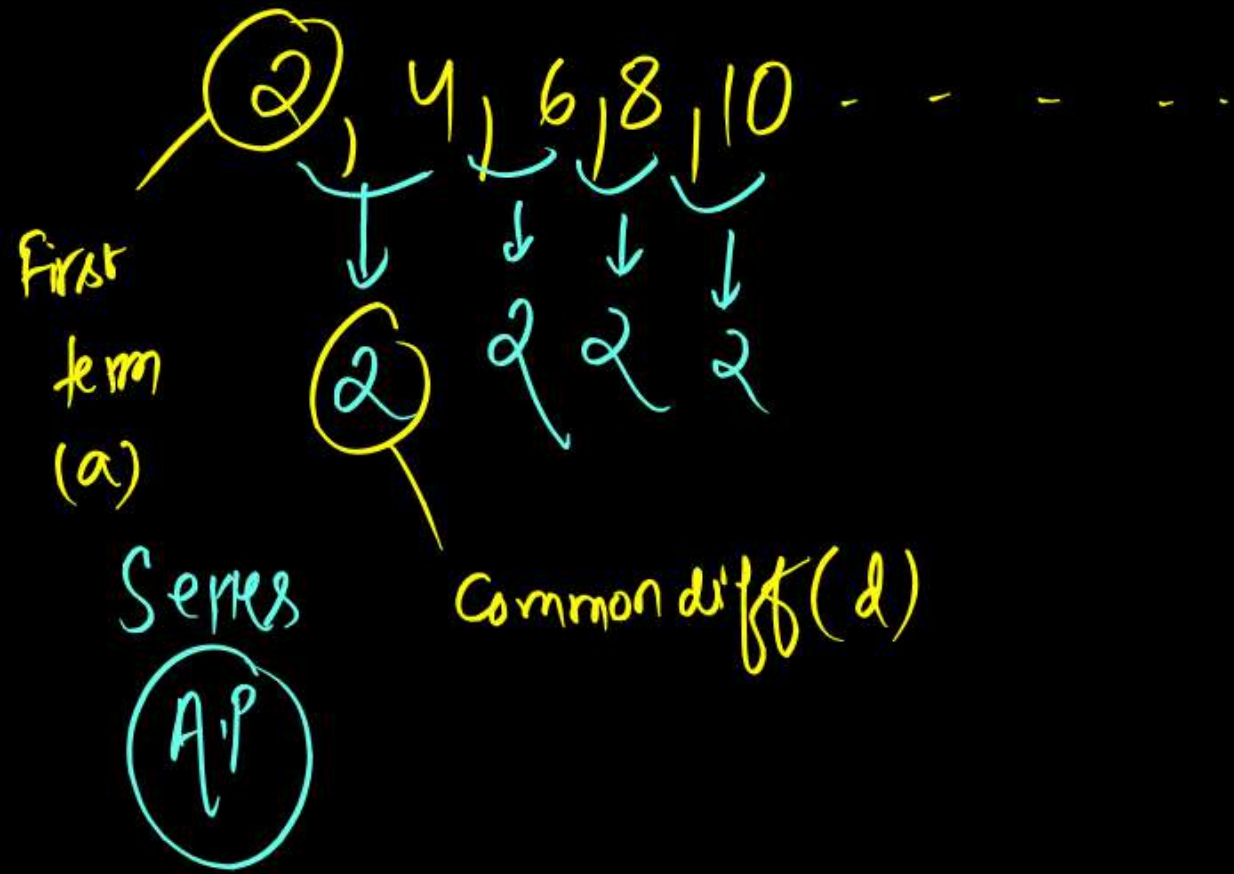
$$a, a + d, a + 2d, a + 3d, \dots$$

Where, the n th term is $t_n = a + (n - 1)d$

Sum of an Arithmetic Progression

The sum of the terms of an arithmetic progression gives an arithmetic series. If the starting value is a and the common difference is d then the sum of the first n terms is

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



$$a, a+d, a+2d, \dots n^{\text{th}}$$

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

$$T_{20} = 2 + 19 \times 2 = 40$$

2, 4, 6, 8, 10, ...
 (10)th term

15, 18, 21, 24, ...
 +3

$$15 + 100 \times 3 = 315$$

20th term



$$2 + 19 \times 2$$

$$= 40$$

$$18, 28, 38 \dots$$

10

$$a, a+d, a+2d \dots n$$

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

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

$$1 + 2 + 3 + 4 + 5 + 6 = \text{sum (योग)}$$

$$\text{Sum} = \frac{(1+6)}{2} \times \text{No. of term}$$

$$= \frac{(1+6)}{2} \times 6$$

$$= 7 \times 3 = 21$$

201th terms

↓

$$18 + 200 \times 10$$

$$\underline{\underline{2018}}$$

$$15, 25, 35, 45, \dots \quad \text{30 terms}$$

$$15 + 30 \times 10$$

$$3015$$

$$\text{Sum} = \left(\frac{I + L}{2} \right) \times \text{No. of terms}$$

$$= \frac{15 + 3015}{2} \times 30$$

$$= \frac{1515}{2} \times 30$$

$$= 1515 \times 30 = 456015$$

$$2, 8, 14, 20, \dots \quad 20^{\text{th}} \text{ term} \quad \text{sum} =$$

$$2 + 19 \times 6$$

$$2 + 114$$

$$= 116$$

$$= \frac{118 \times 20}{2}$$

$$= 1180$$

Arithmetic Mean (AM)

If a, b, c are in AP, b is the Arithmetic Mean (AM) between a and c .

In this case, $\mathbf{b} = \frac{1}{2}(\mathbf{a} + \mathbf{c})$

HARMONIC PROGRESSION (HP)

Non zero numbers $a_1, a_2, a_3, \dots, a_n$ are in Harmonic Progression (HP) if $\frac{1}{a_1}, \frac{1}{a_2}, \frac{1}{a_3}, \dots, \frac{1}{a_n}$ are in AP.
 Harmonic Progression is also known as harmonic sequence.

If $a, (a + d), (a + 2d), \dots$ are in AP, n^{th} term of the AP,

$$t_n = a + (n - 1)d.$$

Hence, if $\frac{1}{a}, \frac{1}{(a+d)}, \frac{1}{(a+2d)}, \dots$ are in HP, n^{th} term of the HP,

$$t_n = \frac{1}{(a + (n - 1)d)}$$

Harmonic Mean (HM)

If a, b, c are in HP, b is the Harmonic Mean (HM) between a and c

$$b = \frac{2ac}{a+c}$$



Relationship between Arithmetic Mean, Harmonic Mean, and Geometric Mean

$$GM^2 = AM \times HM$$



#Q. Find the sum of the first 20 natural numbers ?

प्रथम 20 प्राकृत संख्याओं का योगफल है?

1, 2, 3 - - - 20

$$= \frac{(1+20) \times 20}{2}$$

$$= 210$$

A 210

B 420

C 475

D 400



#Q. find the sum of $(1 + 2 + 3 + 4 + \dots + 998 + 999 + 1000)$?

$1 + 2 + 3 + 4 + \dots + 998 + 999 + 1000$ का योग है?



$$\left(\frac{1 + 1000}{2} \right) \times 1000$$

$$1000 \times 500$$

$$500500$$



A 500500



B 5050



C 550000



D 500505



#Q. Find the sum of $(21 + 22 + 23 + 24 + \dots + 98 + 99)$?

(21 + 22 + 23 + 24 + \dots + 98 + 99) का योग है?

$$\left(\frac{21+99}{2} \right) \times 79$$

$$\frac{60}{2} \times 79$$

$$\begin{aligned} l &= a + (n-1)d \\ \frac{(l-a)}{d} + 1 &= n \\ &= 4740 \end{aligned}$$

$$S =$$

$$\begin{aligned} \frac{99-21}{1} + 1 \\ 78 + 1 \\ = 79 \end{aligned}$$

A 4950

B 5500

C 5050

D 4740



#Q. Find the sum of the first 20 even natural numbers?

प्रथम 20 सम प्राकृत संख्याओं का योगफल है?

A 210

B 420

C 475

D 400



#Q. Find the sum of $(20 + 22 + 24 + 26 + \dots + 998)$?

$(\underbrace{20}_{\div 2} + \underbrace{22}_{\div 2} + \underbrace{24}_{\div 2} + 26 + \dots + \underline{998})$ का योग क्या होगा?

$$\text{Sum} = \frac{(20 + 998)}{2} \times 490$$

$$\frac{509}{1018} \times 490$$

$$= 509 \times 490$$

$$489 \frac{998}{20} + 1$$

$$\frac{978}{2}$$

$$489 + 1 = \underline{490}$$



210000



249410



470855



445142



#Q. Find the sum of all odd numbers from 1 to 100?

1 से 100 तक सभी विषम संख्याओं का योगफल ज्ञात कीजिए?

A 2500

B 2400

C 2600

D 2200



#Q. Find the sum of $(51 + 53 + 55 + \dots + 199)$



?

$(51 + 53 + 55 + \dots + 199)$ का योग ज्ञात कीजिए।?

$$199 = 51 + (n-1)2$$

$$\begin{array}{r} 51 \\ + 48 \\ \hline 74 \end{array} = (n-1)2$$

$$74 = n-1$$

$$n = 75$$

$$\frac{51+199}{2} \times 75$$

$$= \frac{125}{2} \times 75$$

$$= 125 \times 75$$

$$= 3125 \times 3$$

$$= \underline{9375}$$

~~A 2210~~

~~B 1475~~

~~C 1475~~

~~D 1400~~

Question



The value of $\frac{1}{15} + \frac{1}{35} + \frac{1}{63} + \frac{1}{99} + \frac{1}{143}$ is

$\frac{1}{15} = \frac{1}{3 \times 5}$
 $\frac{1}{35} = \frac{1}{5 \times 7}$
 $\frac{1}{63} = \frac{1}{7 \times 9}$
 $\frac{1}{99} = \frac{1}{9 \times 11}$
 $\frac{1}{143} = \frac{1}{11 \times 13}$

$$= \frac{1}{2} \left[\frac{1}{3} - \frac{1}{13} \right] = \text{Answer}$$

$$\frac{1}{1 \times 2} = 1 - \frac{1}{2} = \frac{1}{2}$$

$$\frac{1}{2 \times 3} = \frac{1}{2} - \frac{1}{3} = \frac{3-2}{2 \times 3} = \frac{1}{2 \times 3}$$

$$\frac{1}{15 \times 16} = \frac{1}{15} - \frac{1}{16}$$

$$\frac{1}{3 \times 5} = \frac{1}{2} \left[\frac{1}{3} - \frac{1}{5} \right] = \frac{5-3}{3 \times 5} = \frac{2}{3 \times 5}$$

$$\frac{1}{5 \times 8} = \frac{1}{3} \left[\frac{1}{5} - \frac{1}{8} \right]$$

A

$$\frac{15}{39}$$

B

$$\frac{5}{29}$$

C

$$\frac{5}{39}$$

D

$$\frac{25}{39}$$

$$\frac{1}{2} \left[\frac{1}{3} - \frac{1}{5} \right] + \frac{1}{2} \left[\frac{1}{5} - \frac{1}{7} \right] + \frac{1}{2} \left[\frac{1}{7} - \frac{1}{9} \right] + \frac{1}{2} \left[\frac{1}{11} - \frac{1}{13} \right]$$

$$= \frac{1}{2} \left\{ \frac{1}{3} - \frac{1}{5} + \frac{1}{5} - \frac{1}{7} + \frac{1}{7} - \frac{1}{9} + \frac{1}{11} - \frac{1}{13} \right\}$$

$$= \frac{1}{2} \left\{ \frac{1}{3} - \frac{1}{13} \right\}$$

$$= \frac{1}{2} \left[\frac{13-3}{39} \right] = \frac{1 \times 10}{2 \times 39} = \frac{5}{39}$$

Question

The value of $\frac{1}{20} + \frac{1}{30} + \frac{1}{42} + \frac{1}{56} + \frac{1}{72} + \frac{1}{90}$ is

Handwritten notes:
Under 20: $\widehat{4 \times 5}$
Under 30: $\widehat{5 \times 6}$
Under 42: $\widehat{6 \times 7}$
Under 90: $\widehat{9 \times 10}$

$$= \left(\frac{1}{4} - \frac{1}{10} \right)$$

$$= \frac{5-2}{20} = \frac{3}{20}$$

A

$$\frac{1}{10}$$

B

$$\frac{3}{5}$$

C

$$\frac{3}{20}$$

D

$$\frac{7}{20}$$

Question



$$\frac{1}{20} + \frac{1}{30} + \frac{1}{42} + \frac{1}{56} + \frac{1}{72} + \frac{1}{90} + \frac{1}{110} + \frac{1}{132} \text{ is equal to:}$$

Handwritten notes:
 $\frac{1}{20} \rightarrow 4 \times 5$
 $\frac{1}{30} \rightarrow 5 \times 6$
 $\frac{1}{132} \rightarrow 11 \times 12$

$$= \frac{1}{4} - \frac{1}{12} \Rightarrow \frac{3-1}{12} = \frac{2}{12} = \frac{1}{6}$$

A

$$\frac{1}{8}$$

B

$$\frac{1}{7}$$

C

$$\frac{1}{6}$$

D

$$\frac{1}{10}$$

Question



What is the value of $\frac{1}{3 \times 7} + \frac{1}{7 \times 11} + \frac{1}{11 \times 15} + \dots + \frac{1}{899 \times 903}$?

$\frac{1}{3 \times 7} + \frac{1}{7 \times 11} + \frac{1}{11 \times 15} + \dots + \frac{1}{899 \times 903}$ का मान क्या है?

$$= \frac{1}{4} \left[\frac{1}{3} - \frac{1}{903} \right]$$

$$= \frac{1}{4} \left[\frac{301 - 1}{903} \right]$$

$$= \frac{1}{4} \times \frac{300}{903} = \frac{25}{301}$$

A 21/509

B 18/403

C 25/301

D 29/31

Question



If $S = \frac{1}{1 \times 3 \times 5} + \frac{1}{1 \times 4} + \frac{1}{3 \times 5 \times 7} + \frac{1}{4 \times 7} + \frac{1}{5 \times 7 \times 9} + \frac{1}{7 \times 10} + \dots$ upto 20 terms, then what is the value of S ?

यदि $S = \frac{1}{1 \times 3 \times 5} + \frac{1}{1 \times 4} + \frac{1}{3 \times 5 \times 7} + \frac{1}{4 \times 7} + \frac{1}{5 \times 7 \times 9} + \frac{1}{7 \times 10} + \dots$ 20 पद तक, तो S का मान क्या है?

A 6179/15275

B 6070/14973

C 7191/15174

D 5183/16423



If $S = \frac{1}{1 \times 3 \times 5} + \frac{1}{1 \times 4} + \frac{1}{3 \times 5 \times 7} + \frac{1}{4 \times 7} + \frac{1}{5 \times 7 \times 9} + \frac{1}{7 \times 10} + \dots$ upto 20 terms, then what is the value of S ?

$$N_1 = \frac{1}{1 \times 3 \times 5} + \frac{1}{3 \times 5 \times 7} + \frac{1}{5 \times 7 \times 9} + \dots + \frac{1}{19 \times 21 \times 23} \quad \text{--- } 10^{\text{th}} \text{ term}$$

$$= \frac{1}{4} \left[\frac{1}{1 \times 3} - \frac{1}{3 \times 5} + \frac{1}{3 \times 5} - \frac{1}{5 \times 7} + \dots + \frac{1}{19 \times 21} - \frac{1}{21 \times 23} \right]$$

$$= \frac{1}{4} \left[\frac{1}{3} - \frac{1}{21 \times 23} \right]$$

$$N_2 = \frac{1}{4} \left[\frac{161-1}{21 \times 23} \right]$$

$$= \frac{1}{4} \times \frac{160}{21 \times 23} = \frac{40}{21 \times 23} = \frac{40}{483}$$

$$21 \times 23 = 483$$

$$N_2 = \frac{1}{1 \times 4} + \frac{1}{4 \times 7} + \frac{1}{7 \times 10} \quad \text{--- } 10^{\text{th}} \text{ term}$$

$$= \frac{1}{3} - \frac{1}{31}$$

$$N_2 = \frac{1}{3} \left[1 - \frac{1}{31} \right] = \frac{1}{3} \times \left[\frac{31-1}{31} \right] = \frac{1}{3} \times \frac{30}{31} = \frac{10}{31}$$

$$S = N_1 + N_2 = \frac{40}{483} + \frac{10}{31}$$

$$= \frac{1240 + 4830}{483 \times 31} = \frac{6070}{483 \times 31}$$

$$\frac{1}{1 \times 3 \times 5} = \frac{1}{4} \left[\frac{1}{1 \times 3} - \frac{1}{3 \times 5} \right] = \frac{5-1}{1 \times 3 \times 5} = \left(\frac{4}{1 \times 3 \times 5} \right) \times \frac{1}{4} = \frac{1}{1 \times 3 \times 5}$$

$$\frac{1}{\underbrace{3 \times 5 \times 7}_4} = \frac{1}{4} \left[\frac{1}{3 \times 5} - \frac{1}{5 \times 7} \right]$$

Question



What is the sum of first 40 terms of $1 + 3 + 4 + 5 + 7 + 7 + 10 + 9 + \dots$?

$1 + 3 + 4 + 5 + 7 + 7 + 10 + 9 + \dots$ के प्रथम 40 पद का योग क्या है?

$$(1+4+7 \dots \dots 20^{\text{th}} \text{ term}) + (3+5+7+9 \dots \dots 20^{\text{th}} \text{ term})$$

\downarrow
 $1+19 \times 3$
 58

$3+19 \times 2$
 41

$$\frac{(58+1) \times 20}{2} + \frac{(3+41) \times 20}{2}$$

$$590 + 440$$

$$\begin{array}{r} 590 \\ 440 \\ \hline 1030 \end{array}$$

A 1010

B 1115

C 1030

D 1031

Question

If $A = \frac{1}{1 \times 2} + \frac{1}{1 \times 4} + \frac{1}{2 \times 3} + \frac{1}{4 \times 7} + \frac{1}{3 \times 4} + \frac{1}{7 \times 10} \dots$ upto 20 terms, then what is the value of A ?

यदि $A = \frac{1}{1 \times 2} + \frac{1}{1 \times 4} + \frac{1}{2 \times 3} + \frac{1}{4 \times 7} + \frac{1}{3 \times 4} + \frac{1}{7 \times 10} \dots$ 20 पद तक, तो A का मान क्या है?

$$N_1 = \frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \dots + \frac{1}{10 \times 11} = 1 - \frac{1}{11} = \frac{10}{11}$$

$$N_2 = \frac{1}{1 \times 4} + \frac{1}{4 \times 7} + \frac{1}{7 \times 10} + \dots + \frac{1}{28 \times 31} = \frac{1}{3} \left[1 - \frac{1}{31} \right] = \frac{1}{3} \times \frac{30}{31} = \frac{10}{31}$$

$$N_1 + N_2 = \frac{10}{11} + \frac{10}{31} = \frac{420}{341}$$

A 379/308

B 171/140

C 379/310

D 420/341

Question



What is the sum of $1\frac{1}{2} + 4\frac{1}{6} + 7\frac{1}{12} + 10\frac{1}{20} \dots \dots \dots$ upto 20 terms?

$1\frac{1}{2} + 4\frac{1}{6} + 7\frac{1}{12} + 10\frac{1}{20} \dots \dots 20$ पद तक का योग क्या है?

$$\begin{array}{c} \underbrace{1\frac{1}{2}}_{1 \times 2} + \underbrace{4\frac{1}{6}}_{2 \times 3} + \underbrace{7\frac{1}{12}}_{4 \times 3} + \underbrace{10\frac{1}{20}}_{5 \times 4} \dots \dots \end{array}$$

$$58 \frac{1}{20 \times 21}$$

$$\begin{array}{r} 18 \\ 105 \\ \hline 123 \\ 12390 \\ 20 \\ \hline 12410 \end{array}$$

$$(1 + 4 + 7 + \dots + 58) + \frac{1}{2} + \frac{1}{6} + \dots + \frac{1}{20 \times 21}$$

$$= \frac{(1+58) \times 20}{2} + \left(1 - \frac{1}{21}\right)$$

$$= 590 + \frac{20}{21}$$

$$= \frac{590 \times 21 + 20}{21} = \frac{12410}{21}$$

A 12410/21

B 12412/21

C 12433/21

D 1179/2

Question



If $1 + (1/2) + (1/3) + \dots + (1/20) = k$, then

what is the value of $(1/4) + (1/6) + (1/8) + \dots + (1/40)$?

यदि $1 + (1/2) + (1/3) + \dots + (1/20) = k$, तो $(1/4) + (1/6) + (1/8) + \dots + (1/40)$ का मान क्या है?

H/W

- A** $k/2$
- B** $2k$
- C** $(k - 1)^2$
- D** $(k + 1)/2$

Question



1,4,6,5,11,6 ... Find the sum first 100 terms?

1,4,6,5,11,6 प्रथम 100 पदों का योग ज्ञात कीजिए?

H/W

- A** 7600
- B** 7800
- C** 7900
- D** 8000

Question



$1 - 2 - 3 + 2 - 3 - 4 + 3 - 4 - 5 + \dots$ Find the sum of first 99 terms?

$1 - 2 - 3 + 2 - 3 - 4 + 3 - 4 - 5 + \dots$... प्रथम 99 पदों का योग ज्ञात कीजिए?

Common

H/W

- A** -660
- B** -690
- C** -695
- D** -687

GEOMETRIC PROGRESSION (GP)

A geometric progression, or GP, is a sequence where each new term after the first term is obtained by multiplying the preceding term by a constant r , known as common ratio. If the first term of the sequence is a then the geometric progression is

$t_1 \quad t_2 \quad t_3 \quad t_4$

$$\underline{a}, \underline{ar}, \underline{ar^2}, \underline{ar^3} \dots$$

$$\frac{t_2}{t_1} = \frac{t_3}{t_2}$$

$$\frac{ar}{a} = \frac{ar^2}{ar}$$

$$ar^{n-1} \rightarrow \text{common ratio}$$

Where, the n^{th} term is $t_n = ar^{n-1}$

Sum of Geometric Progression

the sum of the first n terms is

$$S_n = \frac{a(1 - r^n)}{(1 - r)}$$

provided that r not equal to 1.

$$S_n = \frac{a(1 - r^n)}{(1 - r)} \quad r < 1 \quad \checkmark$$

$$= \frac{a(r^n - 1)}{(r - 1)} \quad \checkmark$$

The sum to infinity of a geometric progression

$$S_n = \frac{a}{(1 - r)}$$

$$= \frac{a}{1 - r}$$

Where $-1 < r < 1$.

Geometric Mean (GM)

If non-zero numbers a, b, c are in GP,

The Geometric Mean (GM) between two numbers a and $b = \sqrt{ab}$



$$11 = 1 + 10 \quad \checkmark$$

$$111 = 1 + 10 + 100 \quad \checkmark$$

$$\checkmark \quad 1111 = 1 + 10 + 100 + 1000$$

$$\checkmark \quad 11111 = 1 + 10 + 100 + 1000 + 10000$$

$$\frac{10}{1} = \frac{100}{10}$$

$$\frac{10}{10} = \frac{1000}{100}$$

=

$$= \frac{a(r^n - 1)}{(r - 1)}$$

$$1001 = 7 \times 11 \times 13$$

$$= \frac{10000 - 1}{9} = \frac{9999}{9} = 1111$$

$$= \frac{1(10^4 - 1)}{10 - 1}$$

$$= \frac{(10^5 - 1)}{(10 - 1)} = \frac{10^5}{9}$$

Terms G.P

$$\Rightarrow \frac{555555}{7}$$

$$a^2 - b^2 = (a + b)(a - b)$$

$$\begin{aligned} &= \frac{5555555555}{1000000000} \\ &= 5 \times 111111111 \\ &= 5 \times \frac{(10^9 - 1)}{(10 - 1)} \end{aligned}$$

$$\Rightarrow \frac{5 \times 111111}{7}$$

$$= \frac{5 \times (10^6 - 1)}{9 \times 7} = \frac{5(10^3 + 1)(10^3 - 1)}{9 \times 7}$$

$$= \frac{5 \times 1001 \times (10^3 - 1)}{9 \times 7}$$

$$\frac{aaaaa - \dots n \text{ times}}{(n+1)} \Bigg] \text{Remainder} = '0'$$

7, 11, 13
abcabc

Remainder = '0'

a - should be any

$(n+1) \neq \text{prime Number}$

Prime number > 5

✓✓

7, 11, 13

$$\frac{7777777777777777}{11} =$$

Remainder = '0'

$$\frac{(a^n - 1)}{(a - 1)}$$

$$\frac{5555555555555555}{13} \quad \text{Remainder} = 0$$

$$= 5[1111111111111111]$$

$$= \frac{5(10^{12} - 1)}{9 \times 13} = \frac{5(10^6 + 1)(10^6 - 1)}{9 \times 13} = \frac{5 \times (10^6 + 1)(10^3 - 1)(10^3 + 1)}{9 \times 13}$$

(10-1)

7x11x13

↑

$$\frac{5 \times 1001 \times (10^6 + 1)(10^3 - 1)}{9 \times 13}$$

$$= 0$$

$$\left. \begin{array}{r} 66666 \dots 16 \text{ times} \\ \hline 17 \end{array} \right\}$$

$$= \frac{6 [111 \dots 16 \text{ times}]}{17}$$

$$= \frac{6 [10^{16} - 1]}{[10 - 1] \times 17}$$

$$= \frac{6 (10^8 + 1)(10^8 - 1)}{9 \times 17}$$

$$\frac{1000000000 + 1}{1000000001}$$

17



$$\frac{555555 \dots 12 \text{ times}}{13} \Bigg\} \text{Remainder} = '0'$$



$$\frac{33333333 \dots 18 \text{ times}}{19} = 0$$

SOME IMPORTANT POINTS RELATED TO NUMBERS (अंकों से संबंधित कुछ महत्वपूर्ण बातें)

Sum of first N Natural Number

➤ प्रथम ' n ' प्राकृत संख्याओं का योग = $\frac{n(n+1)}{2}$

Sum of first N even Number

➤ पहली ' n ' सम संख्याओं का योग = $n(n+1)$

Sum of First Odd Num

➤ पहली ' n ' विषम संख्याओं का योग = n^2

Sum of Square of First Nat

➤ पहली ' n ' प्राकृत संख्याओं के वर्गों का योग = $\frac{n(n+1)(2n+1)}{6}$

cube

➤ पहली ' n ' प्राकृत संख्याओं के घनों का योग = $\left[\frac{n(n+1)}{2} \right]^2$



#Q. Calculate the sum of squares of numbers from 1 to 10?

1 से 10 तक की संख्याओं के वर्गों के योगफल की गणना कीजिए?



hw



385



380



384



285



#Q. Find the sum of $(2^2 + 4^2 + 6^2 + \dots + 98^2)$?

$(2^2 + 4^2 + 6^2 + \dots + 98^2)$ का योग ज्ञात कीजिए ?

HW



A 161700



B 254132



C 292540



D 229285



#Q. Find the sum of $(1^2 + 3^2 + 5^2 + \dots + 49^2)$?

$(1^2 + 3^2 + 5^2 + \dots + 49^2)$ का योग ज्ञात कीजिए ?

Hw



20825



23845



29254



29287





#Q. Find the sum of $(1^3 + 2^3 + 3^3 + \dots + 10^3)$?

$(1^3 + 2^3 + 3^3 + \dots + 10^3)$ का योग ज्ञात कीजिए ?

Hw



3025



3028



2925



2928





#Q. Find the sum of $(2^3 + 4^3 + 6^3 + \dots + 20^3)$?

$(2^3 + 4^3 + 6^3 + \dots + 20^3)$ का योग ज्ञात कीजिए ?

H/W



A 24250



B 24200



C 24925



D 24928



#Q. Find the sum of $(1^3 + 3^3 + 5^3 + \dots + 19^3)$?

$(1^3 + 3^3 + 5^3 + \dots + 19^3)$ का योग ज्ञात कीजिए ?

HW



A 36100



B 16200



C 19900



D NOT



#Q. Find the sum of $(4^3 + 5^3 + 6^3 + \dots + 19^3 + 20^3)$?

$(4^3 + 5^3 + 6^3 + \dots + 19^3 + 20^3)$ का योग ज्ञात कीजिए ?



HW



44064



44065



43064



54064



#Q. If $(1^2 + 2^2 + 3^2 + \dots + 20^2) = 2870$ then find the value of $(2^2 + 4^2 + 6^2 + \dots + 40^2)$?

यदि $(1^2 + 2^2 + 3^2 + \dots + 20^2) = 2870$ तो $(2^2 + 4^2 + 6^2 + \dots + 40^2)$ का मान होगा ?

HW

A 11480

B 4585

C 2870

D 24200



#Q. If $(1^3 + 2^3 + 3^3 + \dots + 10^3) = 3025$ then find the value of $(4 + 32 + 108 + \dots + 4000)$?

यदि $(1^3 + 2^3 + 3^3 + \dots + 10^3) = 3025$ हो | तो $(4 + 32 + 108 + \dots + 4000)$ का मान होगा ?

H/W



6050



12100



9075



24200



Tomorrow

5:00 - 7:00

DPP- Soluⁿ

⇒ Number System

Next class N.S



Later PYQ

Q3-II

Q3-I

Q2-II

Q2-I





**JAI
HIND**