

SIMPLIFICATION

Q) एक छात्र को $(2\frac{1}{3} + 2\frac{1}{2} - \frac{1}{6}) \div 2\frac{1}{3} \times 5\frac{2}{3} \div 1\frac{2}{3}$ का $4\frac{1}{4}$
 $3\frac{1}{5} \div 4\frac{1}{2}$ का $5\frac{1}{3} + 5\frac{1}{3} \times \frac{3}{4} \div 2\frac{2}{3}$ का मान ज्ञात करने
 के लिए कहा गया था उसका उत्तर $\frac{6}{7}$ था। सही उत्तर और उसके उत्तर
 में क्या अंतर है?

$$N) \left(\frac{7}{3} + \frac{5}{2} - \frac{1}{6}\right) \div \frac{7}{3} \times \frac{17}{3} \div \frac{5}{3} \text{ का } \frac{17}{4}$$

$$\left(\frac{14+15-1}{6}\right) \times \frac{3}{7} \times \frac{17}{3} \div \frac{85}{12}$$

$$\frac{4 \times 28}{6} \times \frac{3}{7} \times \frac{17}{3} \times \frac{12}{85 \times 5}$$

$$\left(\frac{8}{5}\right)$$

$$D) \frac{16}{5} \div \frac{9}{2} \text{ का } \frac{16}{5} + \frac{16}{3} \times \frac{3}{4} \div \frac{8}{3}$$

$$\frac{16}{5} \div \frac{24}{1} + \frac{16}{3} \times \frac{3}{4} \times \frac{3}{8}$$

$$\frac{2 \times 16}{5} \times \frac{1}{24} + \frac{3}{2}$$

$$\frac{2}{15} + \frac{3}{2} = \left(\frac{49}{30}\right)$$

$$\frac{N}{D} = \frac{\frac{8}{5}}{\frac{49}{30}} = \frac{240}{245} \left(\frac{48}{49}\right)$$

$$\frac{48}{49} - \frac{6}{7} \times \frac{1}{7}$$

$$\frac{48}{49} - \frac{42}{49}$$

$$\text{Diff} = \frac{6}{49}$$

TYPE-III

Q) The value of $99 \frac{95}{99} \times 99 - 95$ is
 $99 \frac{95}{99} \times 99 - 95$ का मान है:

$$\frac{9801 + 95}{99} \times 99 - 95$$

$$9801 + 95 - 95$$

$$= 9801$$

Trick

$$\boxed{99 \frac{95}{99} \times 99} - 95$$

$$\begin{array}{r} 9900 \\ - 95 \\ \hline 9896 - 95 \\ 9801 \end{array}$$

Q) Simplify : सरलीकरण

$$999 \frac{998}{999} \times 999 + 999$$

$$\begin{array}{r} 999000 \\ - 999 \\ \hline 998999 + 999 \\ 999998 \end{array}$$

Q) $9999 \frac{9997}{9999} \times 99$

$$\begin{array}{r} 999900 \\ - 99 \\ \hline 999899 \end{array}$$

• $8+8+8 = 24$
 $8 \times 3 = 24$

• $70+70 = 140$
 $70 \times 2 = 140$

• $2\frac{5}{7} = 2 + \frac{5}{7}$

• $1+2+3+4+\dots+n$
 $= \frac{n(n+1)}{2}$

Q) Find the value of $999\frac{1}{7} + 999\frac{2}{7} + 999\frac{3}{7} + 999\frac{4}{7} + 999\frac{5}{7} + 999\frac{6}{7}$
का मान क्या है?

$$999 + \frac{1}{7} + 999 + \frac{2}{7} + 999 + \frac{3}{7} + 999 + \frac{4}{7} + 999 + \frac{5}{7} + 999 + \frac{6}{7}$$

$$999 \times 6 + \frac{1+2+3+4+5+6}{7}$$

$$5994 + \frac{21}{7}$$

$$5997$$

Q) Find the value of $777\frac{1}{5} + 777\frac{2}{5} + 777\frac{3}{5} + 777\frac{4}{5}$

$777\frac{1}{5} + 777\frac{2}{5} + 777\frac{3}{5} + 777\frac{4}{5}$ का मान ज्ञात करें।

$$777 \times 4 + \frac{1+2+3+4}{5}$$

$$3108 + \frac{10}{5}$$

$$3110$$

TYPE-IV

Q) $1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{2}{5}}}}$

$$\begin{array}{ccccccc} 3 & 5 & 8 & 13 & 21 & 34 & \\ \hline & & & 34 & & & \\ & & & 21 & & & \end{array}$$

Q) $1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{2}{3}}}}}$

$$\begin{array}{cccccccc} 2 & 3 & 5 & 8 & 13 & 21 & 34 & 55 \\ \hline & + & + & + & + & + & + & \\ & & & & 55 & & & \\ & & & & 34 & & & \end{array}$$

Q) Find the value of $4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{2 + \frac{1}{4}}}}$

4 - $\frac{5}{1 + \frac{1}{3 + \frac{1}{2 + \frac{1}{4}}}}$ का मान ज्ञात कीजिए।

$$4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{2 + \frac{1}{4}}}}$$

$$2 + \frac{1}{4} = \frac{9}{4}$$

$$3 + \frac{4}{9} = \frac{31}{9}$$

$$1 + \frac{9}{31} = \frac{40}{31}$$

$$4 - \frac{155}{40} = \frac{160 - 155}{40} = \frac{5}{40} = \frac{1}{8}$$

Q) Simplify / सरल बनाएं

$$\frac{19}{43} + \frac{1}{2 + \frac{1}{3 + \frac{1}{1 + \frac{1}{4}}}}$$

$$1 + \frac{1}{4} = \frac{5}{4}$$

$$3 + \frac{4}{5} = \frac{19}{5}$$

$$2 + \frac{5}{19} = \frac{43}{19}$$

$$\frac{19}{43} + \frac{19}{43} = \frac{38}{43}$$

Q) Find the value of x in the following equation.

निम्न समीकरण में x का मान ज्ञात कीजिए

$$\left[1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{5}}} \right] \div \frac{6}{11} = \frac{x}{2}$$

$$1 + \frac{5}{6} = \frac{11}{6}$$

$$1 + \frac{6}{11} = \frac{17}{11}$$

$$\frac{17}{11} \div \frac{17}{11} = \frac{x}{2}$$

$$1 = \frac{x}{2}$$

$$x = 2$$

Q) Simplify the following
निम्नलिखित को सरल कीजिए

$$240 \div \frac{5}{1 \div \frac{4}{1 \div \frac{5}{1 \div 3} \frac{1}{3}}} \frac{1}{15} \frac{1}{60}$$

$$240 \div 300 = \frac{240}{300} \frac{4}{5}$$

Q) $\frac{1}{2a + \frac{1}{b + \frac{1}{4c}}} = \frac{9}{26}$ find $a + b + c = ?$

$$\frac{1}{\frac{26}{9}}$$

$$\frac{1}{2 + \frac{8}{9}}$$

$$\frac{1}{2 + \frac{1}{\frac{9}{8}}} = \frac{1}{2 + \frac{1}{1 + \frac{1}{8}}}$$

On comparing

$$2a = 2$$

$$a = 1$$

$$b = 1$$

$$4c = 8$$

$$c = 2$$

$$a + b + c$$

$$1 + 1 + 2 = 4$$

Q) If $\frac{1}{x + \frac{1}{y + \frac{2}{z + \frac{1}{4}}}} = \frac{29}{79}$, where x, y and z are natural numbers then

the value $(2x+3y-z)$ is:

यदि $\frac{1}{x + \frac{1}{y + \frac{2}{z + \frac{1}{4}}}} = \frac{29}{79}$, जहाँ x, y और z प्राकृतिक संख्याएँ हैं, तो $(2x+3y-z)$

का मान है:

$$\frac{1}{\frac{79}{29}} = \frac{1}{2 + \frac{21}{29}}$$

$$\boxed{x=2}$$

$$\frac{1}{y + \frac{2}{z + \frac{1}{4}}} = \frac{1}{\frac{29}{21}} = \frac{1}{1 + \frac{8}{21}}$$

$$\boxed{y=1}$$

$$\frac{2}{z + \frac{1}{4}} = \frac{8}{21}$$

$$21 = 4z + 1$$

$$\cancel{1}z = \cancel{20}$$

$$\boxed{z=5}$$

$$\boxed{z=5}$$

$$(2x+3y-z)$$

$$2 \times 2 + 3 \times 1 - 5$$

$$4 + 3 - 5$$

$$7 - 5$$

$$2$$

TYPE-V

Q) Find the value of the following
निम्नलिखित का मान ज्ञात कीजिए।

$$\frac{1}{5 \times 8} + \frac{1}{8 \times 11} + \frac{1}{11 \times 14} + \frac{1}{14 \times 17}$$

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

$$\frac{1}{8 \times 11} = \frac{1}{3} \left[\frac{1}{8} - \frac{1}{11} \right]$$

$$\frac{1}{11 \times 14} = \frac{1}{3} \left[\frac{1}{11} - \frac{1}{14} \right]$$

$$\frac{1}{14 \times 17} = \frac{1}{3} \left[\frac{1}{14} - \frac{1}{17} \right]$$

$$\frac{1}{3} \left[\frac{1}{5} - \frac{1}{8} + \frac{1}{8} - \frac{1}{11} + \frac{1}{11} - \frac{1}{14} + \frac{1}{14} - \frac{1}{17} \right]$$

$$\frac{1}{3} \left[\frac{1}{5} - \frac{1}{17} \right]$$

$$\frac{1}{3} \left[\frac{12}{85} \right]$$

$$\frac{4}{85}$$

Formula

$$\frac{1}{\text{diff}} \times \left[\frac{1}{\text{First term}} - \frac{1}{\text{last term}} \right]$$

$$\frac{1}{5 \times 8} + \frac{1}{8 \times 11} + \frac{1}{11 \times 14} + \frac{1}{14 \times 17}$$

$$\rightarrow \frac{1}{3} \left[\frac{1}{5} - \frac{1}{17} \right]$$

$$\frac{4}{85}$$

Q) What is the value of

$$\frac{1}{3 \times 7} + \frac{1}{7 \times 11} + \frac{1}{11 \times 15} + \dots + \frac{1}{899 \times 903}$$

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

$$\frac{1}{\text{diff}} \left[\frac{1}{\text{Ist}} - \frac{1}{\text{last}} \right]$$

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

$$\frac{1}{4} \left[\frac{100^{25}}{2709} \right] = \frac{25}{301}$$

Q) Which of the following statements is / are correct
निम्नलिखित में से कौन सा / से कयन सत्य है / हैं ?

I. $\frac{1}{1 \times 3} + \frac{1}{3 \times 5} + \frac{1}{5 \times 7} + \dots + \frac{1}{11 \times 13} = \frac{12}{13}$

II. $\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \dots + \frac{1}{12 \times 13} = \frac{12}{13}$

(I) $\frac{1}{2} \left[\frac{1}{1} - \frac{1}{13} \right]$

$$\frac{1}{2} \left[\frac{12}{13} \right] = \frac{6}{13}$$

(II) $\left[\frac{1}{1} - \frac{1}{13} \right]$

$$\frac{12}{13}$$

केवल II

1. Simplify: $999 \frac{995}{999} \times 999$

$999 \frac{995}{999} \times 999$ को हल करो।

- (a) 998296 (b) 997996
(c) 998995 (d) 998996

2. Simplify: $\frac{1}{7} + \left(999 \frac{692}{693}\right) \times 99$

$\frac{1}{7} + \left(999 \frac{692}{693}\right) \times 99$ को हल करो।

- (a) 94009 (b) 99000
(c) 99004 (d) 99006

3. Calculate : $\frac{1}{5} + \left(999 \frac{494}{495} \times 99\right)$

हल करो : $\frac{1}{5} + \left(999 \frac{494}{495} \times 99\right)$

- (a) 90090 (b) 99004
(c) 99000 (d) 99099

4. Find the value of:

$$1\frac{1}{2} + 11\frac{1}{2} + 111\frac{1}{2} + 1111\frac{1}{2}$$

- (a) 1136 (b) 1036
(c) 1336 (d) 1236

5. Find the value of:

$$129\frac{1}{8} + 129\frac{3}{8} + 129\frac{5}{8} + 129\frac{7}{8}$$

- a. 516
b. 517
c. 515
d. 518

6. Find the value of:

$$412\frac{2}{11} + 412\frac{3}{11} + 412\frac{5}{11} + 412\frac{6}{11} + 412\frac{8}{11} + 412\frac{9}{11}$$

- a. 2472
b. 2470
c. 2468
d. 2475

7. Find the value of $1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{5}}}}$

$1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{5}}}}$ का मान ज्ञात कीजिए।

- (a) $\frac{15}{9}$ (b) $\frac{13}{7}$
(c) $\frac{16}{10}$ (d) $\frac{17}{11}$

8. Find the value of $1 - \frac{1}{1 - \frac{1}{1 - \frac{1}{1 - \frac{1}{6}}}}$

$1 - \frac{1}{1 - \frac{1}{1 - \frac{1}{1 - \frac{1}{6}}}}$ का मान ज्ञात कीजिए।

(a) 3

(b) 4

(c) 5

(d) 6

9. If $2 = x + \frac{1}{1 + \frac{1}{5 + \frac{1}{2}}}$ then find the value of x.

यदि $2 = x + \frac{1}{1 + \frac{1}{5 + \frac{1}{2}}}$ है, तो x का मान ज्ञात कीजिए।

(a) $\frac{14}{13}$

(b) 1

(c) $\frac{13}{15}$

(d) $\frac{15}{13}$

10. $\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \frac{1}{4 \times 5} + \frac{1}{5 \times 6} + \dots + \frac{1}{9 \times 10}$ Find the value of /का मान ज्ञात कीजिए।

(a) 1/10

(b) 5/11

(c) 9/10

(d) 2/5

11. If $x = \frac{1}{12.13} + \frac{1}{13.14} + \frac{1}{14.15} \dots + \frac{1}{23.24}$, $y = \frac{1}{36.37} + \frac{1}{37.38} + \frac{1}{38.39} + \dots + \frac{1}{71.72}$ then $\frac{x}{y}$ is equal to -

यदि $x = \frac{1}{12.13} + \frac{1}{13.14} + \frac{1}{14.15} \dots + \frac{1}{23.24}$, $y = \frac{1}{36.37} + \frac{1}{37.38} + \frac{1}{38.39} + \dots + \frac{1}{71.72}$ हो, तो $\frac{x}{y}$ किसके समान होगा?

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

(b) $\frac{1}{24}$

(c) $\frac{1}{72}$

(d) 3

ANSWER SHEET

1	2	3	4	5	6	7	8	9	10	11
D	B	C	D	D	D	D	D	D	C	D

Worksheet solution

Sol 1

$$999 \frac{995}{999} \times 999$$
$$= \frac{998001 + 995}{999} \times 999$$

$$= 998996 \text{ Ans}$$

Sol 2

$$\frac{1}{7} + \left(999 \frac{692}{693} \right) \times 99$$
$$= \frac{1}{7} + \frac{692307 + 692}{693} \times 99$$

$$= \frac{1}{7} + \frac{692999}{7}$$

$$= \frac{693000}{7}$$

$$= 99000 \text{ Ans}$$

Sol 3

$$\frac{1}{5} + \left(999 \frac{494}{495} \times 99 \right)$$
$$= \frac{1}{5} + \frac{494505 + 494}{495} \times 99$$

$$= \frac{1}{5} + \frac{494999}{5}$$

$$= \frac{495000}{5} = 99000 \text{ Ans}$$

Sol 4

$$1\frac{1}{2} + 11\frac{1}{2} + 111\frac{1}{2} + 1111\frac{1}{2}$$
$$= 1 + 11 + 111 + 1111 + \frac{1+1+1+1}{2}$$
$$= 1234 + 2$$
$$= 1236$$

Sol 5

$$129\frac{1}{8} + 129\frac{3}{8} + 129\frac{5}{8} + 129\frac{7}{8}$$
$$= 129 \times 4 + \frac{1+3+5+7}{8}$$
$$= 516 + 2$$
$$= 518$$

Sol 6

$$412\frac{2}{11} + 412\frac{3}{11} + 412\frac{5}{11} + 412\frac{6}{11} +$$
$$412\frac{8}{11} + 412\frac{9}{11}$$
$$= 412 \times 6 + \frac{2+3+5+6+8+9}{11}$$

$$= 2472 + 3$$

$$= 2475 \text{ Ans}$$

Sol 7

$$1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{5}}}$$

$$= 1 + \frac{1}{1 + \frac{5}{6}}$$

$$= 1 + \frac{6}{11} = \frac{17}{11} \underline{\text{Ans}}$$

Sol 8

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

$$= 1 - \frac{1}{1 - \frac{6}{5}}$$

$$= 1 - \frac{5}{-1}$$

$$= -\frac{6}{-1} = 6 \underline{\text{Ans}}$$

Sol 9

$$2 = n + \frac{1}{1 + \frac{1}{5 + \frac{1}{2}}}$$

$$2 = n + \frac{1}{1 + \frac{2}{11}}$$

$$2 = n + \frac{11}{13}$$

$$26 = 13n + 11$$

$$13n = 15$$

$$n = \frac{15}{13} \underline{\text{Ans}}$$

Sol 10

$$\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \frac{1}{4 \times 5} + \dots + \frac{1}{9 \times 10}$$

$$= \left[\frac{1}{1} - \frac{1}{2} \right] + \left[\frac{1}{2} - \frac{1}{3} \right] + \left[\frac{1}{3} - \frac{1}{4} \right] + \dots + \left[\frac{1}{9} - \frac{1}{10} \right]$$

$$= \left[\frac{1}{1} - \frac{1}{10} \right] = \left[\frac{10-1}{10} \right]$$

$$= \frac{9}{10} \underline{\text{Ans}}$$

Sol 11

$$n = \frac{1}{12 \times 13} + \frac{1}{13 \times 14} + \dots + \frac{1}{23 \times 24}$$

$$= \frac{1}{12} - \frac{1}{13} + \frac{1}{13} - \frac{1}{14} + \dots + \frac{1}{23} - \frac{1}{24}$$

$$= \frac{1}{12} - \frac{1}{24} = \frac{2-1}{24} = \frac{1}{24}$$

$$y = \frac{1}{36 \times 37} + \frac{1}{37 \times 38} + \dots + \frac{1}{71 \times 72}$$

$$= \frac{1}{36} - \frac{1}{37} + \frac{1}{37} - \frac{1}{38} + \dots + \frac{1}{71} - \frac{1}{72}$$

$$= \frac{1}{36} - \frac{1}{72} = \frac{2-1}{72} = \frac{1}{72}$$

$$\therefore \frac{n}{y} = \frac{\frac{1}{24}}{\frac{1}{72}} = \frac{72}{24} = 3 \underline{\text{Ans}}$$