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SIMPLIFICATION

सरणीकरण

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Bracket



01.

Simplify :

$$1 + 2 + 3 + \dots + 999 + 1000 + 999 + \dots + 2 + 1$$

(a) 999000

(b) 1000000

(c) 999999

(d) 990000

$$1 + 2 + 3 + \dots + 999 + 1000 + 999 + \dots + 3 + 2 + 1$$

$$1 + 2 + 3 + 4 + \dots + 36 + 37 + 36 + \dots + 2 + 1$$

$$37^2 = 1369$$

$$1000^2 = 10,000,000$$

02.

Simplify :

$$\sqrt{1+2+3+\dots+78+79+78+\dots+2+1}=?$$

(a) 78

(b) 6084

(c) 79

(d) 6241

$$\sqrt{1+2+3+\dots+78+79+78+\dots+2+1}$$

$$= \sqrt{79^2}$$
$$= 79$$

03.

$$\sqrt{1+2+3+\dots+(x-1)+x+(x-1)+\dots+2+1}=169$$

Find the value of x .

(a) 169

(b) 13

(c) 144

(d) 12

$$\sqrt{1+2+3+\dots+(x-1)+x+(x-1)+\dots+2+1}=169$$

$$\sqrt{x^2}=169$$

$$x=169$$

04.

What is the value of

$$\sqrt{\sqrt{4600 + \sqrt{540 + \sqrt{1280 + \sqrt{250 + \sqrt{36}}}}}}$$

(a) 69

(b) 68

(c) 70

(d) 72

$$\sqrt{\sqrt{4600 + \sqrt{\frac{540 + 36}{576} + \sqrt{\frac{1280 + 16}{1296} + \sqrt{\frac{250 + 6}{256} + \sqrt{36}}}}}}$$

$$\sqrt{4624} = 68$$

$$\# (a+b)^2 = a^2 + 2ab + b^2$$

$$\# (a-b)^2 = a^2 - 2ab + b^2$$

योग

$$\textcircled{i} (a+b)^2 + (a-b)^2 = 2(a^2 + b^2)$$

अंतर

$$\textcircled{ii} (a+b)^2 - (a-b)^2 = 4ab$$

$$\textcircled{1} \frac{(a+b)^2 + (a-b)^2}{a^2 + b^2} = \frac{2(a^2 + b^2)}{(a^2 + b^2)} = 2$$

$$\textcircled{2} \frac{(a+b)^2 - (a-b)^2}{ab} = \frac{4ab}{ab} = 4$$

$$\textcircled{3} \frac{a^3 - b^3}{a^2 + ab + b^2} = \frac{(a-b)(a^2 + ab + b^2)}{(a^2 + ab + b^2)} = (a-b)$$

$$\textcircled{4} \frac{a^3 + b^3}{(a^2 - ab + b^2)} = \frac{(a+b)(a^2 - ab + b^2)}{(a^2 - ab + b^2)} = (a+b)$$

$$\textcircled{5} \frac{a^3+b^3+c^3-3abc}{(a^2+b^2+c^2-ab-bc-ca)} = \frac{(a+b+c) \cancel{[a^2+b^2+c^2-ab-bc-ca]}}{\cancel{(a^2+b^2+c^2-ab-bc-ca)}} = a+b+c$$

05.

The value of $\frac{18.43 \times 18.43 - 6.57 \times 6.57}{11.86}$ is:

$\frac{18.43 \times 18.43 - 6.57 \times 6.57}{11.86}$ का मान है:

(a) 23.62

(b) 25

(c) 26

(d) 24.12

$$\frac{(18.43 + 6.57)(18.43 - 6.57)}{11.86} = \frac{18.43}{6.57} \times \frac{11.86}{25.00}$$

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

06.

$$x = \frac{(943 + 864)^2 - (943 - 864)^2}{(1886 \times 1728)} = ?$$

(a) 1

(b) 4

(c) 79

(d) 1789

$$\frac{(a+b)^2 - (a-b)^2}{4ab} = 1$$

$$\frac{(943+864)^2 - (943-864)^2}{2 \times 943 \times 2 \times 864} = \frac{4}{4} = 1$$

07.

$\frac{5.75 \times 5.75 \times 5.75 + 3.25 \times 3.25 \times 3.25}{57.5 \times 57.5 + 32.5 \times 32.5 - 57.5 \times 32.5}$ is equal to :

(a) 0.009

(b) 0.0009

(c) 0.9

(d) 0.09

$$\frac{a^3 + b^3}{a^2 + b^2 - ab} = (a+b)$$

5.75
3.25

9 Ans.

07.

$\frac{5.75 \times 5.75 \times 5.75 + 3.25 \times 3.25 \times 3.25}{57.5 \times 57.5 + 32.5 \times 32.5 - 57.5 \times 32.5}$ is equal to :

(a) 0.009

(b) 0.0009

(c) 0.9

(d) 0.09

$$\frac{a^3 + b^3}{a^2 + b^2 - ab} = (a+b)$$

$$\frac{9}{100} = 0.09$$

08.

If $N = 1 + 11 + 111 + 1111 + \dots + 111111111$, then what is the sum of the digit's of N ?

यदि $N = 1 + 11 + 111 + 1111 + \dots + 111111111$ हो, तो N के अंकों का योग क्या है ?

(a) 45

(b) 18

(c) 36

(d) 5

$$1 + 2 + 3 + 4 + \dots + 9 = \frac{n(n+1)}{2} = \frac{9 \times 10}{2} = 45$$

09. $\sqrt{1} + \sqrt{121} + \sqrt{12321} + \dots + \sqrt{1234567654321} = ?$

(a) 1234567

(b) 1234566

(c) 1234565

(d) None

$$\begin{array}{r} 1234567 \\ -1 \\ \hline 1234566 \end{array}$$

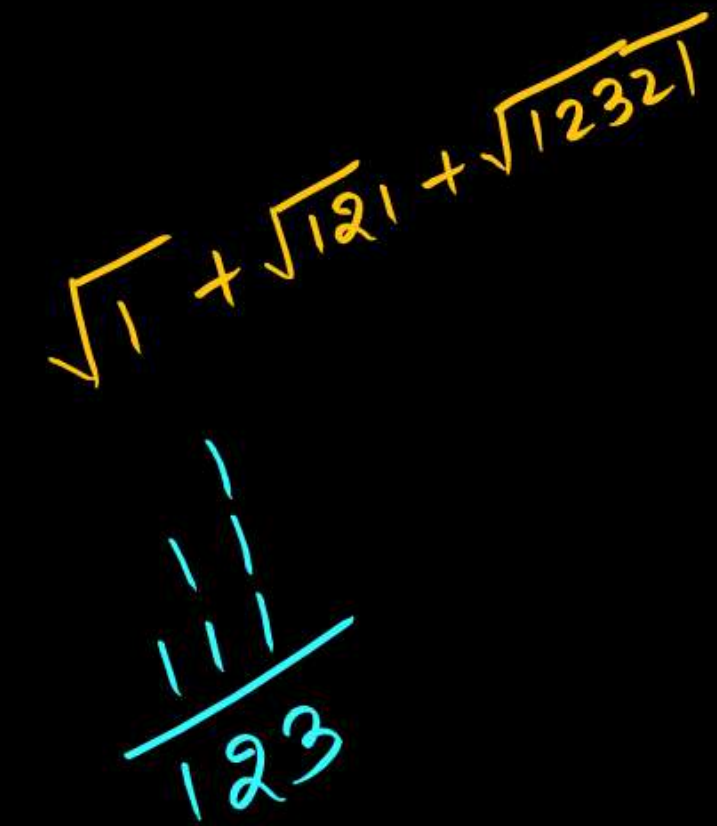
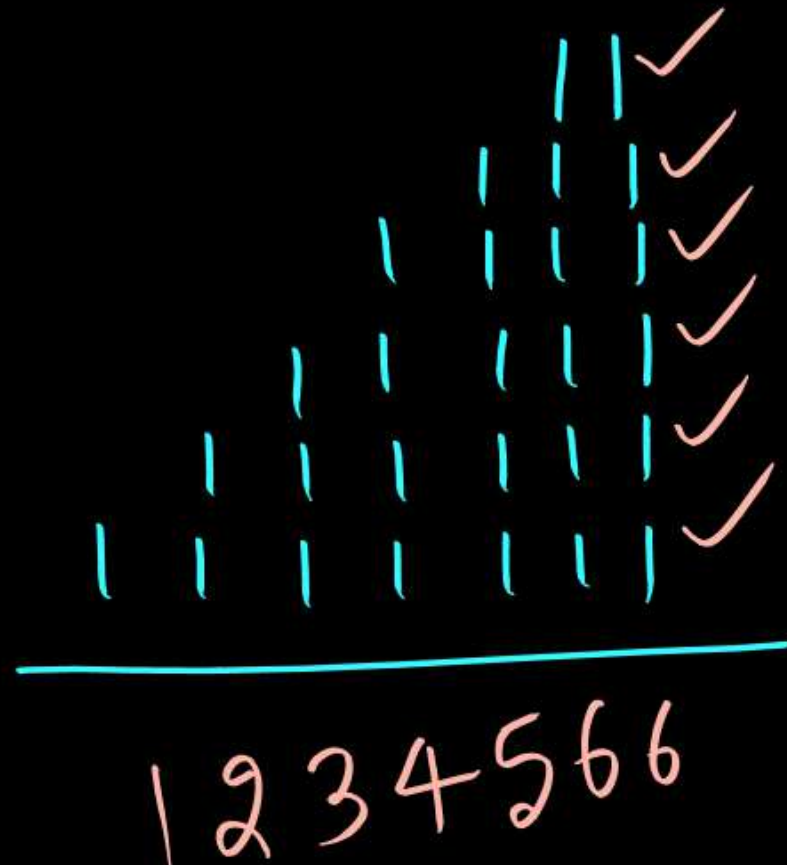
$$1^2 = 1$$

$$11^2 = 121$$

$$111^2 = 12321$$

$$1111^2 = 1234321$$

$$11111^2 = 123454321$$



Series

$$\textcircled{i} \quad \frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \frac{1}{4 \times 5} + \frac{1}{5 \times 6} + \frac{1}{6 \times 7} = \frac{1}{\text{diff}} \times \left[\frac{1}{F} - \frac{1}{L} \right]$$
$$= \frac{1}{1} \times \left[\frac{1}{1} - \frac{1}{7} \right]$$

$$\textcircled{ii} \quad \frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \frac{1}{42} = 1 \times \frac{6}{7} = \frac{6}{7}$$

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

$$1 - \frac{1}{7} = \frac{6}{7} \text{ Ans.}$$

$$\# \quad \frac{1}{4 \times 5} + \frac{1}{5 \times 6} + \frac{1}{6 \times 7} + \frac{1}{7 \times 8} + \frac{1}{8 \times 9} + \frac{1}{9 \times 10} + \frac{1}{10 \times 11}$$

$$\frac{1}{4} - \frac{1}{11} = \frac{11-4}{44} = \frac{7}{44}$$

$$\frac{1}{1} \times \left[\frac{1}{4} - \frac{1}{11} \right] = 1 \times \frac{7}{44} = \frac{7}{44}$$

$$\# \frac{1}{2 \times 5} + \frac{1}{5 \times 8} + \frac{1}{8 \times 11} + \frac{1}{11 \times 14} + \frac{1}{14 \times 17} + \frac{1}{17 \times 20}$$

$$\frac{1}{\text{diff}} \times \left[\frac{1}{f} - \frac{1}{l} \right]$$

$$\frac{10-1}{20}$$

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

$$\frac{1}{3} \times \left[\frac{1}{2} - \frac{1}{20} \right]$$

$$\frac{1}{3} \times \frac{9}{20} = \frac{3}{20}$$

$$\frac{1}{2} \times \left[\frac{1}{1 \times 2} - \frac{1}{6 \times 7} \right]$$

$$\frac{1}{2} \times \left[\frac{1}{2} - \frac{1}{42} \right] = \frac{1}{2} \times \frac{20}{42} = \frac{10}{21}$$

$$= \frac{5}{21}$$

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

$$\frac{1}{3} \times \left[\frac{1}{1 \times 2 \times 3} - \frac{1}{5 \times 6 \times 7} \right]$$

$$\frac{1}{3} \times \frac{34}{105} = \frac{17}{315}$$

10.

$$\left(1^2 - \frac{1}{2^2}\right) \left(1^2 - \frac{1}{3^2}\right) \left(1^2 - \frac{1}{4^2}\right) \dots \dots \dots \left(1^2 - \frac{1}{120^2}\right) = ?$$

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

(a) $\frac{119}{240}$

(b) $\frac{119}{120}$

(c) $\frac{120}{240}$

(d) $\frac{121}{240}$

$$\left(1 + \frac{1}{2}\right) \left(1 - \frac{1}{2}\right) \times \left(1 + \frac{1}{3}\right) \left(1 - \frac{1}{3}\right) \times \left(1 + \frac{1}{4}\right) \left(1 - \frac{1}{4}\right) \times \dots \dots \dots \times \left(1 + \frac{1}{120}\right) \left(1 - \frac{1}{120}\right)$$

$$\left[\left(1 + \frac{1}{2}\right) \left(1 + \frac{1}{3}\right) \left(1 + \frac{1}{4}\right) \dots \dots \dots \times \left(1 + \frac{1}{120}\right) \right] \times \left[\left(1 - \frac{1}{2}\right) \left(1 - \frac{1}{3}\right) \left(1 - \frac{1}{4}\right) \times \dots \dots \times \left(1 - \frac{1}{120}\right) \right]$$

$$\left[\frac{3}{2} \times \frac{4}{3} \times \frac{5}{4} \times \dots \times \frac{121}{120} \right] \times \left[\frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} \times \dots \times \frac{119}{120} \right]$$

$$\frac{121}{2} \times \frac{1}{120} = \frac{121}{240}$$

11.

If $\left(1 - \frac{1}{2^2}\right)\left(1 - \frac{1}{3^2}\right)\left(1 - \frac{1}{4^2}\right) \dots \dots \dots \left(1 - \frac{1}{N^2}\right) = \frac{85}{168}$, then the value of N is :

(a) 84

(b) 82

(c) 81

(d) 80



12.

When simplified, the product $\left(2 - \frac{1}{3}\right)\left(2 - \frac{3}{5}\right)\left(2 - \frac{5}{7}\right) \dots \left(2 - \frac{997}{999}\right)$ equals

(a) $\frac{5}{999}$

(b) $\frac{5}{3}$

(c) $\frac{1001}{999}$

(d) $\frac{1001}{3}$



13.

If $\left(1 + \frac{1}{2}\right)\left(1 + \frac{1}{4}\right)\left(1 + \frac{1}{6}\right)\left(1 + \frac{1}{8}\right)\left(1 - \frac{1}{3}\right)\left(1 - \frac{1}{5}\right)\left(1 - \frac{1}{7}\right) = 1 + \frac{1}{x}$, then what is the value of x ?

यदि $\left(1 + \frac{1}{2}\right)\left(1 + \frac{1}{4}\right)\left(1 + \frac{1}{6}\right)\left(1 + \frac{1}{8}\right)\left(1 - \frac{1}{3}\right)\left(1 - \frac{1}{5}\right)\left(1 - \frac{1}{7}\right) = 1 + \frac{1}{x}$ हो, तो x का मान क्या है ?

(a) 6

(b) 8

(c) 5

(d) 7



14.

The value of $4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{2 + \frac{1}{4}}}}$ is

(a) $\frac{1}{8}$

(b) $\frac{1}{64}$

(c) $\frac{1}{16}$

(d) $\frac{1}{32}$



15.

If $\frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{x}}}} = \frac{5}{8}$, then what is the value of x ?

यदि $\frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{x}}}} = \frac{5}{8}$ हो, तो x का मान क्या है ?

(a) 2

(b) 3

(c) 1

(d) 4



16.

$$\frac{1}{a + \frac{1}{b + \frac{1}{c + \frac{1}{d}}}} = \frac{29}{154}, \text{ then } a + b + c + d = ?$$

(a) 12

(b) 13

(c) 14

(d) 15



17.

If $(x + 7957 \times 7965)$ is a perfect square, then find the value of x ?

(a) 1

(b) 16

(c) 9

(d) 25



18.

$$(3+1)(3^2+1)(3^4+1)(3^8+1)(3^{16}+1) = ?$$

(a) $\frac{(3^{12}-1)}{2}$

(b) $\frac{(3^{16}-1)}{2}$

(c) $\frac{(3^{64}-1)}{2}$

(d) $\frac{(3^{128}-1)}{2}$



19.

The value of $(5 + 3 \div 5 \times 5) \div (3 \div 3 \text{ of } 6)$ of $(4 \times 4 \div 4 \text{ of } 4 + 4 \div 4 \times 4)$ is :

$(5 + 3 \div 5 \times 5) \div (3 \div 3 \text{ का } 6)$ का $(4 \times 4 \div 4 \text{ का } 4 + 4 \div 4 \times 4)$ का मान है—

(a) $8\frac{1}{5}$

(b) $7\frac{1}{3}$

(c) $9\frac{3}{5}$

(d) $6\frac{2}{3}$



20.

$24 \times 2 \div 12 + 12 \div 6$ of $2 \div (15 \div 8 \times 4)$ of $(28 \div 7$ of $5)$ is :

$24 \times 2 \div 12 + 12 \div 6$ का $2 \div (15 \div 8 \times 4)$ का $(28 \div 7$ of $5)$ का मान क्या है ?

(a) $4\frac{2}{3}$

(b) $4\frac{8}{75}$

(c) $4\frac{32}{75}$

(d) $4\frac{1}{6}$



21.

The simplified value of $3 \times 6 \div 4$ of $6 - 6 \div 2 \times (4 - 6) + 4 - 2 \times 3 \div 6$ of $\frac{1}{3}$ is:

$3 \times 6 \div 4$ of $6 - 6 \div 2 \times (4 - 6) + 4 - 2 \times 3 \div 6$ का $\frac{1}{3}$ का सरलीकृत मान है :



22. The value of $\frac{7 + 8 \times 8 \div 8 \text{ of } 8 + 8 \div 8 \times 4 \text{ of } 4}{4 \div 4 \text{ of } 4 + 4 \times 4 \div 4 - 4 \div 4 \text{ of } 2}$ is :

$\frac{7 + 8 \times 8 \div 8 \text{ of } 8 + 8 \div 8 \times 4 \text{ of } 4}{4 \div 4 \text{ of } 4 + 4 \times 4 \div 4 - 4 \div 4 \text{ of } 2}$ का मान है :

(a) 4.6

(b) 8.7

(c) 7.8

(d) 6.4

