MATHS

BOOKS - S CHAND IIT JEE FOUNDATION

FRACTIONS

Solved Examples

1. Find the value of $\frac{2}{1+\frac{1}{1-\frac{1}{2}}} \times \frac{3}{\frac{5}{6}\text{of}\frac{3}{2} \div 1\frac{1}{4}}$

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2. If $5\frac{1}{6} - \left[1\frac{1}{5} + \left\{2\frac{3}{4} + 5\frac{1}{2} + x - \left(\frac{5}{6} - \frac{2}{3}\right)\right\}\right] = 2\frac{61}{120}$ then the value of x is

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3. Find the value of $\frac{1}{1+\frac{1}{3-\frac{4}{2+\frac{1}{3-\frac{1}{2}}}}}+\frac{3}{3-\frac{4}{3+\frac{1}{1-\frac{1}{2}}}}$

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4. यदि $\frac{1}{4}\times\frac{2}{6}\times\frac{3}{8}\times\frac{5}{12}\times\ldots\ldots\ldots\times\frac{31}{64}=\frac{1}{2^x}$ है तो x का मान क्या होगा?

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5. If $N=\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+\frac{1}{20}+\frac{1}{30}+\ldots\ldots\ldots+\frac{1}{156}$ what is the value of N?

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6. The value of $\frac{3}{1^{22}\hat{}\,2}+\frac{5}{2^{23}\hat{}\,2}+\frac{7}{3^{24}\hat{}\,2}+\frac{9}{4^{25}\hat{}\,2}+\frac{11}{5^{26}\hat{}\,2}+\frac{13}{6^{27}\hat{}\,2}+\frac{15}{7^{28}\hat{}\,2}$ is $\frac{1}{100}$ (b) $\frac{99}{100}$ (c) 1 (d) $\frac{101}{100}$

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7. Production of wheat is $2\frac{1}{4}$ times that of rice, but the cost of rice is $1\frac{1}{4}$ times that of wheat. IF a farmer produces wheat in place of rie, then what is his income in terms of the previous income.

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8. If a man spends $\frac{5}{6}$ th part of money and then earns $\frac{1}{2}$ part of the remaining money what part of the money is with his now?

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9. A women sells to the first customer half her stock of apples, to the second customer she sells half her remaining stock and so on to the third customer. She now has 15 apples left. How many apples did she have initially?

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10. Eight people are planning to share equally the cost of a rental car. If one person withdraws from the arrangement and the others share equally the entire cost of the car, then the share of each of the remaining persons increased by:

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Question Bank 2

1. Which of the following fractions is the largest? $\frac{7}{8}$ (b) $\frac{13}{16}$ (c) $\frac{31}{40}$ (d) $\frac{63}{80}$

A. $\frac{13}{16}$

B. $\frac{7}{8}$

C. $\frac{31}{40}$

D. $\frac{63}{80}$

Answer: B

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2. Which of the following fractions is less than $\frac{7}{8}$ and greater than $\frac{1}{3}$?

$\frac{1}{4}$ (b) $\frac{23}{24}$ (c) $\frac{11}{12}$ (d) $\frac{17}{24}$

A. $\frac{1}{4}$

B. $\frac{23}{24}$

C. $\frac{11}{12}$

D. $\frac{17}{24}$

Answer: D

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3. Madan picks up two different digits from the set {1,2,3,4,5} and forms a 2-digit number. What is the difference between the largest and smallest number that can be formed?

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4. What fraction of $\frac{4}{7}$ must be added to itself to make the sum $1\frac{1}{14}$? $\frac{1}{2}$ (b) $\frac{4}{7}$ (c) $\frac{7}{8}$ (d) $\frac{15}{14}$

A. $\frac{1}{2}$

B. $\frac{4}{7}$

C. $\frac{7}{8}$

D. $\frac{15}{14}$

Answer: C

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5. If $a = \left(\frac{1}{10}\right)^2$, $b = \frac{1}{5}$ and $c = \sqrt{\frac{1}{100}}$, then which of the following statements is correct?

A. $a < b < c$

B. $a < c < b$

C. $b < c < a$

D. $c < a < b$

Answer: B

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6. Mohan ate half a pizza on Monday. He ate half of what was left on Tuesday and so on. He followed this pattern for one week. How much of the pizza would he have eaten during the week?

A. 0.9922

B. 0.95

C. 0.9822

D. 1

Answer: A

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7. The least fraction that must be added to $1\frac{1}{3} \div 1\frac{1}{2} \div 1\frac{1}{9}$ to make the result an integer is

A. $\frac{4}{5}$

B. $\frac{3}{5}$

C. $\frac{2}{5}$

D. $\frac{1}{5}$

Answer: D

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8. The expression $\frac{5\frac{5}{8}}{6\frac{3}{7}}$ of $\frac{6\frac{7}{11}}{9\frac{1}{8}} \div \frac{8}{9}\left(2\frac{3}{11} + \frac{13}{22}\right)$ of $\frac{3}{5}$ equals (a) 1 (b) $\frac{1}{2}$ (c) $\frac{7}{9}$ (d) $\frac{5}{12}$

A. 1

B. $\frac{1}{2}$

C. $\frac{5}{12}$

D. $\frac{7}{9}$

Answer: C

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9. Find the value of x in the following:

$$1\frac{2}{3} \div \frac{2}{7} \times \frac{x}{7} = 1\frac{1}{4} \times \frac{2}{3} \div \frac{1}{6}$$

A. 0.006

B. $\frac{1}{6}$

C. 0.6

D. 6

Answer: D

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10. At the first stop on his route, a driver unloaded $\frac{2}{5}$ of the packages in his van. After he unloaded another 3 packages at his next step $\frac{1}{2}$ of the original numbekr of packages remained. How many packages were in the van before the first delivery?

A. 25

B. 10

C. 30

D. 36

Answer: C

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11. A student was asked to solve the fraction $\frac{\frac{7}{3}+1\frac{1}{2}\,of\,\frac{5}{3}}{2+1\frac{2}{3}}$ and his answer was $\frac{1}{4}$. By how much was his answer wrong? 1 (b) $\frac{1}{55}$ (c) $\frac{1}{220}$ (d) None of these

A. 1

B. $\frac{1}{55}$

C. $\frac{1}{220}$

D. $1\frac{3}{44}$

Answer: D

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12. Simplify: $\frac{1}{2}+\left[\frac{1}{2}\times\frac{1}{2}\div\left\{\frac{1}{2}\times\frac{1}{2}\div\frac{1}{2}+\left(\frac{1}{2}\div\frac{1}{2}\right)\right\}\right]$

A. $\frac{2}{3}$

B. $\frac{1}{2}$

C. $\frac{1}{4}$

D. $\frac{1}{5}$

Answer: A

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13. If $\dfrac{2+\frac{1}{\frac{34}{5}}}{2+\frac{1}{3+\frac{1}{1+\frac{1}{4}}}} = x$, then the value of x is

A. 1

B. $\frac{3}{7}$

C. $\frac{1}{7}$

D. $\frac{8}{7}$

Answer: A

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14. If $x = 1 + \dfrac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{2}}}}$, then the value of $2x + \frac{7}{4}$ is

A. 3

B. 4

C. 5

D. 6

Answer: C

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15. Simplify $\left[3\frac{1}{4} \div \left\{1\frac{1}{4} - \frac{1}{2}\left(2\frac{1}{2} - \overline{\frac{1}{4} - \frac{1}{6}}\right)\right\}\right] \div \left(\frac{1}{2} \text{of } 4\frac{1}{3}\right)$

A. 18

B. $\frac{36}{5}$

C. 39

D. 78

Answer: B

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16.

$$\frac{1}{1.2}+\frac{1}{2.3}+\frac{1}{3.4}+\ldots\ldots\ldots\ldots+\frac{1}{n(n+1)}=\frac{n}{n+1}\,\forall n\in N.$$

A. always greater than 1

B. always less than 1

C. always equal to 0

D. always a negative integer.

Answer: B

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17. Find the value of the following expression upto four places of decimals.

$$\left[1+\frac{1}{1\times 2}+\frac{1}{1\times 2\times 4}+\frac{1}{1\times 2\times 4\times 8}+\frac{1}{1\times 2\times 4\times 8\times 16}\right]$$

(a) 1.6414 (b) 1.6415 (c) 1.6416 (d) 1.6428

A. 1.6416

B. 1.2937

C. 1.6414

D. 1.6415

Answer: A

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18. Find the value of

$$\left(1-\frac{1}{2^2}\right)\left(1-\frac{1}{3^2}\right)\left(1-\frac{1}{4^2}\right)\left(1-\frac{1}{5^2}\right)\ldots\ldots\left(1-\frac{1}{9^2}\right)\left(1-\frac{1}{10^2}\right)$$

A. $\frac{5}{12}$

B. $\frac{1}{2}$

C. $\frac{11}{20}$

D. $\frac{7}{10}$

Answer: C

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

A. $\frac{1}{8}$

B. $\frac{1}{7}$

C. $\frac{1}{6}$

D. $\frac{1}{10}$

Answer: C

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20. A lamp post has half of its length in mud, $\frac{1}{3}$ of its length in water and $3\frac{1}{3}$ m above the water. Find the total length of the post?

A. 20m

B. 15m

C. 25m

D. 30m

Answer: A

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21. A fraction is greater than its reciprocal by $\frac{9}{20}$.What is the fraction?

A. $\frac{3}{5}$

B. $\frac{3}{10}$

C. $\frac{4}{5}$

D. $\frac{5}{4}$

Answer: C

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22. What would be the reciprocal of the sum of the reciprocals of the numbers $\frac{3}{5}$ and $\frac{7}{3}$?

A. $\frac{1}{42}$

B. $\frac{21}{44}$

C. $\frac{4}{5}$

D. $\frac{36}{55}$

Answer: B

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23. The product of two fractions is $\frac{14}{15}$ and their quotient is $\frac{35}{24}$. The greater fraction is $\frac{4}{5}$ b. $\frac{7}{6}$ c. $\frac{7}{4}$ d. $\frac{7}{3}$

A. $\frac{7}{4}$

B. $\frac{7}{6}$

C. $\frac{7}{3}$

D. $\frac{4}{5}$

Answer: B

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24. Chandran gave one fourth of his money to Suresh. Suresh in turn gave one third of what he received to Jayesh. If the difference between the amount of Suresh and Jayesh is Rs. 100, how much did Chandran have?

A. Rs. 450

B. Rs. 600

C. Rs. 800

D. Rs. 900

Answer: B

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25. From a number of apples, a man sells half the number of existing apples plus 1 to the first customer, sells $\frac{1}{3}rd$ of the remaining apples plus 1 to the second customer and $\frac{1}{5}th$ of the remaining apples plus 1 to the third customer. He then finds that he has 3 apples left. How many apples did he have originally? (a) 15 (b) 18 (c) 20 (d) 25

A. 12

B. 14

C. 15

D. 13

Answer: B

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Self Assessment Sheet 2

1. Which of the following sets of fractions is in the correct sequence of ascending order of their values?

A. $-\frac{1}{2}, \frac{5}{6}, \frac{-4}{-9}$

B. $-\frac{3}{7}, \frac{-5}{6}, \frac{3}{5}$

C. $\left(-\frac{1}{2}, -\frac{4}{9}, \frac{5}{6}\right)$

D. $\left(-\frac{4}{9}, \frac{5}{6}, \frac{1}{6}\right)$

Answer: C

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2. If $\frac{3}{4}$ of an estate is worth Rs. 90,000 then the value of $\frac{2}{3}$ of the same will be

A. Rs. 60,000

B. Rs. 65,000

C. Rs. 70,000

D. Rs. 80,000

Answer: D

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3. What is the value of x in $1+\frac{1}{1+\frac{1}{1+\frac{1}{x}}}=\frac{11}{7}$?

A. 1

B. 3

C. $\frac{1}{2}$

D. $\frac{7}{11}$

Answer: B

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4. The fraction $\frac{3}{5}$ is found between which pair of fractions on a number line?

A. $\frac{7}{10}$ and $\frac{3}{4}$

B. $\frac{2}{5}$ and $\frac{1}{2}$

C. $\frac{1}{3}$ and $\frac{5}{13}$

D. $\frac{2}{7}$ and $\frac{8}{11}$

Answer: D

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5. $\frac{4}{15}$ of $\frac{5}{7}$ of a number is greater than $\frac{4}{9}$ of $\frac{2}{5}$ of the same number by 8. What is half of that number?

A. 630

B. 315

C. 210

D. 105

Answer: B

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6. If two third of three fourth of a number add to three fourth of the fourth fifth of the number is x times the number, the value of x is

A. $\frac{11}{10}$

B. $1\frac{1}{11}$

C. $\frac{10}{11}$

D. $\frac{9}{11}$

Answer: A

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7. What is the missing figure in the expression given ?

$$\frac{16}{7} \times \frac{16}{7} - \frac{\otimes}{7} \times \frac{9}{7} + \frac{9}{7} \times \frac{9}{7} = 1$$

A. 1

B. 7

C. 4.57

D. 32

Answer: D

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8. Simplify: $\frac{2\frac{3}{4}}{1\frac{5}{6}} \div \frac{7}{8} \times \left(\frac{1}{3} + \frac{1}{4}\right) + \frac{5}{7} \div \frac{3}{4}$ of $\frac{3}{7}$

A. $\frac{56}{77}$

B. $\frac{49}{80}$

C. $\frac{2}{3}$

D. $3\frac{2}{9}$

Answer: D

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9. Find the GCD of the fractions $\frac{3}{5}, \frac{4}{7}$ and $\frac{7}{10}$. The following are the steps involved in solving the above problem. Arrange them in the sequential order.

(A) We have, the GCD of fractins $= \frac{\text{GCD of numerators}}{\text{LCM of denominators}}$

(B) The rquired GCD $= \frac{1}{70}$

(C) The GCD of $3, 4, 7, is 1,$. The LCM of $5, 7$ and $10 is 70.$

A. $\frac{105}{48}$

B. $\frac{1}{4}$

C. $\frac{1}{48}$

D. None

Answer: D

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10. Suppose $a = \frac{2}{3}b$, $b = \frac{2}{3}c$, and $c = \frac{2}{3}d$ what would be the value of b as a fraction of d?

A. $\frac{2}{3}$

B. $\frac{4}{3}$

C. $\frac{4}{9}$

D. $\frac{8}{27}$

Answer: C

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