MATHS

BOOKS - MTG IIT JEE FOUNDATION

RATIONAL NUMBERS

Illustrations

1. Express each of the following as a rational number:

(i) $\frac{-2}{5}+\left(\frac{11}{5}+\frac{-3}{5}\right)$

(ii) $\left(\frac{-2}{5}+\frac{11}{5}\right)+\frac{-3}{5}$

What do your see?

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2. Simplify: $\frac{3}{8}+\frac{7}{2}+\frac{-3}{5}+\frac{9}{8}+\frac{-3}{2}+\frac{6}{5}$

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3. Verify:

$\left(\frac{a}{b}+\frac{c}{d}\right)+\frac{e}{f}=\frac{a}{b}+\left(\frac{c}{d}+\frac{e}{f}\right)f$ or $\frac{a}{b}=\frac{-2}{3},\frac{c}{d}=\frac{5}{7}and\frac{e}{f}=\frac{-1}{6}$

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4. The product of two rational numbers is $\frac{-28}{81}$. If one of the number is $\frac{14}{27}$, find the other

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5. Express the following expressions in its lowest terms.

$\left(\frac{12}{5}\times\frac{3}{4}\right)+\left(\frac{12}{5}\times\frac{7}{2}\right)$

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6. Express the following expressions in its lowest terms.

$$\left(\frac{2}{3}\times\frac{-5}{7}\right)-\left(\frac{2}{3}\times\frac{4}{5}\right)$$

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7. Simplify : $\left(\frac{-3}{2}+\frac{4}{5}\right)+\left(\frac{9}{5}+\frac{-10}{3}\right)-\left(\frac{1}{2}+\frac{3}{4}\right)$

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8. Represent $\frac{5}{3} and \frac{-5}{3}$ one the number line

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9. Represent $\frac{11}{4}$ on the number line.

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10. Find a rational number lying between $\frac{1}{3}$ and $\frac{1}{2}$.

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11. Find three rational numbers between -2 and 5.

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Solved Examples

1. Write the additive inverse of each of the following rational numbers: $\frac{4}{9}$

(ii) $\frac{-13}{7}$ (iii) $\frac{5}{-11}$ (iv) $\frac{-11}{-14}$

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2. Write the additive inverse of each of the following rational numbers: $\frac{4}{9}$

(ii) $\frac{-13}{7}$ (iii) $\frac{5}{-11}$ (iv) $\frac{-11}{-14}$

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3. Verify that  --{\rm{ }}(--x)

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4. Verify that  --{\rm{ }}(--x)

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5. What number should be substracted from $\frac{27}{13}$ to get $\frac{-3}{7}$?

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6. The sum of two rational numbers is $\frac{-1}{2}$. If one of them is $\frac{-9}{10}$, find the other.

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7. Using commutativity and associativity of addition of ration of numbers, express each of the following as a rational number: $\frac{4}{3}+\frac{-4}{5}+\frac{-2}{3}+\frac{7}{5}-2$

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8. Re- arrange suitably and find the sum: $\frac{-4}{7}+\frac{7}{6}+\frac{2}{7}+3+\frac{-11}{6}$

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9. What number should be added to $\frac{-5}{8}$ so as to get $\frac{5}{9}$?

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10. Subtract $\frac{-8}{33}$ from $\frac{-5}{11}$.

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11. Subtract the sum of $\frac{-4}{7}$ and $\frac{5}{14}$ from the sum of $\frac{9}{14}$ and $\frac{23}{14}$.

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12. Evaluate : $\frac{-12}{5}+\frac{-7}{20}+\frac{3}{14}+\frac{1}{7}+\frac{-1}{10}$

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13. Simplify : $\left(\frac{-7}{18}x\frac{15}{-7}\right)-\left(1x\frac{1}{4}\right)+\left(\frac{1}{2}x\frac{1}{4}\right)$

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14. Divide : $\frac{3}{5}by\frac{4}{25}$ (ii) $\frac{-8}{9}by\frac{4}{3}$ $\frac{-16}{21}by\frac{-4}{3}$ (iv) $\frac{8}{13}by\frac{3}{-26}$

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15. Divide: $\frac{-16}{21}$ $by \frac{4}{3}$ (ii) $\frac{-8}{13}$ $by \frac{3}{-26}$

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16. 14 The product of two numbers is 14/15. If one of the numbers is (-20/17). Find the other

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17. Represent $\frac{15}{4}$ and $\frac{-15}{4}$ on the number line.

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18. Express $\left(\frac{1}{2}+\frac{3}{4}\right) \div 2$ as a rational number and show that it lies between $\frac{1}{2}$ and $\frac{3}{4}$.

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19. Find 10 rational numbers between $\frac{-2}{11}$ and $\frac{9}{11}$.

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Ncert Section Exercise 1 1

1. Using appropriate properties find. (i)

 - \frac{2}{3} \times \frac{3}{5} + \frac{5}{2} - \frac{3}{5} \times \frac{1}{6}

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2. v31

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3. Write the additive inverse of each of the following. (i) \frac{2}{8}

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4. Write the additive inverse of each of the following. (i) \frac{2}{8}

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5. Write the additive inverse of each of the following. (i) \frac{2}{8}

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6. Write the additive inverse of each of the following. (i) \frac{2}{8}

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7. Write the additive inverse of each of the following. (i) \frac{2}{8}

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8. Verify that  --{\rm{ }}(--x){\rm{ }} = x

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9. Verify that  --{\rm{ }}(--x){\rm{ }} = x

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10. Find the multiplicative inverse of the following. (i)  - 13

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11. Find the multiplicative inverse of the following. (i)  - 13

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12. Find the multiplicative inverse of the following.

$\frac{1}{5}$

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13. Find the multiplicative inverse of the following. (i)  - 13

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14. Find the multiplicative inverse of the following. (i)  - 13

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15. Find the multiplicative inverse of the following.

-1

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16. Name the property under multiplication used in each of the following. (i)

 \frac{{ - 4}}{5} \times 1 = 1 \times \frac{{ - 4}}{5} = - \frac{4}{5}

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17. Name the property under multiplication used in each of the following. (i) 

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18. Name the property under multiplication used in each of the following. (i) 

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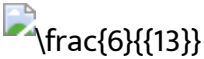
19. Multiply 

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20. Tell what property allows you to compute 

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21. Is $\frac{8}{9}$ the multiplicative inverse of $-1\frac{1}{8}$? Why or why not?

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22. Is 0.3 the multiplicative inverse of  3\frac{1}{3}

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23. Write.

The rational number that does not have a reciprocal.

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24. Write.

The rational numbers that equal to their reciprocals.

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25. The rational number that is equal to its negative.

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26. Fill in the blanks.

Zero has ..... reciprocal.

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27. Fill in the blanks.

The number .....and..... are their own reciprocals.

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28. Fill in the blanks.

The reciprocal of -5 is ..... .

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29. Fill in the blanks.

Reciprocal of $\frac{1}{x}$, where $x \neq 0$ is ..... .

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30. Fill in the blanks.

The product of two rational numbers is always a ..... .

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31. Fill in the blanks.

The reciprocal of positive rational number is ..... .

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Ncert Section Exercise 1 2

1. Represent these numbers on the number line. (i)

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2. Represent these numbers on the number line. (i)

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3. Represent  \frac{{ - 2}}{{11}},\,\frac{{ - 5}}{{11}},\,\,\frac{{ - 9}}{{11}}

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4. Write five rational numbers which are smaller than 2.

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5. Find ten rational numbers between $\frac{-2}{5} and \frac{1}{2}$.

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6. Find five rational numbers between. (i) $\frac{2}{3}$ and $\frac{4}{5}$, (ii) $\frac{-3}{2}$ and $\frac{5}{3}$

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7. Find five rational numbers between $\frac{-3}{2} and \frac{5}{3}$.

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8. Find five rational numbers between $\frac{1}{4}$ and $\frac{1}{2}$

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9. Write five rational numbers greater than -2

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10. Find ten rational numbers between  \frac{3}{5}\,\,and\,\,\frac{3}{4}

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Exercise Multiple Choice Questions Level 1

1. The sum of the additive inverse and multiplicative inverse of 2 is

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

B. $\frac{-3}{2}$

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

D. $\frac{-1}{2}$

Answer:

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2. Additive inverse of $\frac{3}{-4}$ is

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

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

C. 3

D. 0

Answer:

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3. The standard form of $\frac{192}{-168}$ is

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

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

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

D. $\frac{-6}{7}$

Answer:

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4. The number which is subtracted from $\frac{27}{13}$ to get $\frac{-3}{7}$, is

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5. The additive inverse of $\frac{-a}{b}$ is

A. $\frac{a}{b}$

B. $\frac{b}{a}$

C. $\frac{-b}{a}$

D. $\frac{-a}{b}$

Answer:

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6. Standard form of $\frac{-24}{36}$ is a rational number with denominator

A. 3

B. 4

C. 1

D. 2

Answer:

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7. Which of the following statements is false?

A. Every fraction is a rational number.

B. Every rational number is a fraction.

C. Every integer is a rational number.

D. All of these

Answer:

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8. Find a rational number between $\frac{1}{4}$ and $\frac{1}{3}$.

A. $\frac{7}{24}$

B. 0.29

C. $\frac{13}{48}$

D. All of these

Answer:

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9. Which of the following statements is true?

A. $\frac{5}{7} < \frac{7}{9} < \frac{9}{11} < \frac{11}{13}$

B. $\frac{11}{13} < \frac{9}{11} < \frac{7}{9} < \frac{5}{7}$

C. $\frac{5}{7} < \frac{11}{13} < \frac{7}{9} < \frac{9}{11}$

D. $\frac{5}{7} < \frac{9}{11} < \frac{11}{13} < \frac{7}{9}$

Answer:

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10. The value of x for which the two rational numbers $\frac{3}{7}$ and $\frac{x}{42}$ are equivalent, is

A. 18

B. 15

C. 12

D. 10

Answer:

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11. Multiplicative inverse of '0' is

A. -1

B. 0

C. does not exist

D. 1

Answer:

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12. 0.75 when represented as rational number, is

A. $\frac{75}{99}$

B. $\frac{75}{90}$

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

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

Answer:

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13. The value of expression $\frac{2}{3}+\frac{5}{11}+\frac{(-1)}{3}+\frac{(-3)}{11}$ is equal to

A. $\frac{1}{33}$

B. $\frac{2}{33}$

C. $\frac{10}{33}$

D. $\frac{17}{33}$

Answer:

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14. Which of the following illustrates the inverse property of addition?

A. $3+(-3)=0$

B. $3-(-3)=6$

C. $3+0=3$

D. $3-0=3$

Answer:

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15. The difference between the largest and the smallest of the rationals, $\frac{5}{8}, \frac{7}{12}, \frac{1}{3}, \frac{2}{5}$, is

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

B. $\frac{-5}{24}$

C. $\frac{7}{24}$

D. $\frac{13}{21}$

Answer:

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16. The additive inverse of sum of the rational numbers $-\frac{5}{16}$ and $\frac{7}{12}$ is

A. $-\frac{7}{48}$

B. $\frac{1}{24}$

C. $-\frac{13}{48}$

D. $\frac{13}{48}$

Answer:

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17. What number should be added to $\frac{7}{12}$ to get $\frac{4}{15}$?

A. $-\frac{19}{60}$

B. $-\frac{11}{30}$

C. $\frac{51}{60}$

D. $\frac{1}{20}$

Answer:

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18. Which of the following rational numbers is the smallest?

$$-\frac{5}{16}, \frac{-3}{4}, \frac{-13}{24} \text{ and } \frac{7}{-12}$$

A. $-\frac{5}{16}$

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

C. $\frac{-13}{24}$

D. $\frac{-7}{12}$

Answer:

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19. $\left(\frac{2}{3}+\frac{-4}{5}+\frac{7}{15}+\frac{-11}{20}\right)=?$

A. $-\frac{1}{5}$

B. $-\frac{13}{60}$

C. $-\frac{4}{15}$

D. $-\frac{7}{30}$

Answer:

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20. What number should be subtracted from -3/5 to get-2?

A. $-\frac{7}{5}$

B. $-\frac{13}{5}$

C. $\frac{13}{5}$

D. $\frac{7}{5}$

Answer:

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21. Name the law of multiplication illustrated by the statement, $\frac{-15}{8} \times \frac{-12}{7} = \frac{-12}{7} \times \frac{-15}{8}$.

A. Associative law

B. Closure law

C. Commutative law

D. None of these

Answer:

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22. Which of the following forms a pair of equivalent rational numbers?

A. $\frac{14}{35}$ and $\frac{21}{45}$

B. $\frac{-12}{26}$ and $\frac{18}{39}$

C. $\frac{-3}{7}$ and $\frac{-21}{36}$

D. $\frac{-7}{28}$ and $\frac{-5}{20}$

Answer:

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23. The reciprocal of $\left(-\frac{9}{16} \times \frac{8}{15}\right)$ is

A. $-\frac{3}{10}$

B. $-\frac{4}{150}$

C. $-\frac{10}{3}$

D. $-\frac{2}{50}$

Answer:

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24. The value of $\left(-\frac{5}{9} \div \frac{2}{3}\right)$ is

A. $-\frac{5}{2}$

B. $-\frac{5}{6}$

C. $-\frac{16}{12}$

D. $-\frac{6}{5}$

Answer:

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25. Which of the following rational numbers is in its standard form?

A. $\frac{-12}{26}$

B. $\frac{-49}{91}$

C. $\frac{-90}{16}$

D. $\frac{-4}{15}$

Answer:

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26. By what number should we multiply $\frac{3}{-14}$, so that the product may be $\frac{5}{12}$.

A. $\frac{-35}{18}$

B. $\frac{34}{19}$

C. $\frac{35}{18}$

D. $\frac{-34}{19}$

Answer:

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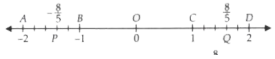
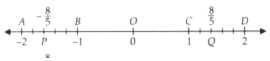
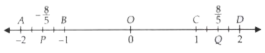
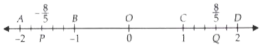
27. Represent $\frac{8}{5}$ and $\frac{-8}{5}$ on the number line.

A. 

B. 

C. 

D. 

Answer:

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28. Find the value of $\frac{4}{9}+\left(\frac{-7}{11}\right)+\left(\frac{-8}{27}\right)$.

A. $\frac{145}{297}$

B. $\frac{-145}{297}$

C. $\frac{-152}{297}$

D. $\frac{-135}{617}$

Answer:

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29. The sum of two rational numbers is $\frac{-3}{5}$. If one of the number is $\frac{-9}{20}$, find the other.

A. $\frac{7}{20}$

B. $\frac{27}{100}$

C. $\frac{-21}{20}$

D. $\frac{-3}{20}$

Answer:

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30. Find : $\frac{3}{4}+\left(\frac{-3}{5}\right)+\left(\frac{-2}{3}\right)+\frac{5}{8}+\left(\frac{-4}{15}\right)$

A. $\frac{149}{120}$

B. $\frac{-19}{120}$

C. $\frac{-37}{110}$

D. $\frac{43}{110}$

Answer:

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31. Multiply $\frac{7}{8}$ by the reciprocal of $\frac{-23}{85}$.

A. $\frac{-161}{184}$

B. $-3\frac{43}{184}$

C. $\frac{-39}{56}$

D. $\frac{-161}{580}$

Answer:

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32. The area of a rectangle is $45\frac{5}{16}cm^2$. If its length is $7\frac{1}{4}$ cm, then find its breadth.

A. $6\frac{1}{4}cm$

B. $4\frac{1}{6}cm$

C. $328\frac{33}{64}cm$

D. $38\frac{1}{16}cm$

Answer:

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33. Simplify : $1+\frac{14}{35}+\left(\frac{-75}{105}\right)+\frac{27}{15}$

A. $1\frac{51}{105}$

B. $2\frac{52}{105}$

C. $\frac{61}{45}$

D. $2\frac{17}{35}$

Answer:

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34. Which of the following rational numbers is in the standard form?

A. $\frac{14}{-36}$

B. $\frac{-5}{23}$

C. $\frac{75}{-15}$

D. None of these

Answer:

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35. Which of the following rational numbers lie(s) between -1 and -2?

A. $\frac{-19}{10}$

B. $\frac{-11}{10}$

C. $\frac{-17}{10}$

D. All of these

Answer:

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Exercise Multiple Choice Questions Level 2

1. If $\frac{3}{7}+x+\left(\frac{-8}{21}\right)+\frac{5}{22}=\frac{-125}{462}$, then x is

A. $\frac{6}{11}$

B. $\frac{-5}{11}$

C. $\frac{-6}{11}$

D. $\frac{5}{11}$

Answer:

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2. Product of two numbers is $25\frac{3}{8}$. If one of them is $15\frac{19}{40}$, then other number is

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

B. $1\frac{2}{3}$

C. $5\frac{2}{3}$

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

Answer:

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3. $\frac{-1}{4}$ is a rational number between

A. 0 and $\frac{1}{4}$

B. -1 and 0

C. 1 and 2

D. -2 and -1

Answer:

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4. Which of the rational numbers $\frac{-11}{28}, \frac{-5}{7}, \frac{9}{-14}, \frac{29}{-42}$ is the greatest?

A. $\frac{-11}{28}$

B. $\frac{-5}{7}$

C. $\frac{9}{-14}$

D. $\frac{29}{-42}$

Answer:

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5. The product of two numbers is $\frac{-16}{35}$. If one of the numbers is $\frac{-15}{14}$, the other is

A. $-\frac{2}{5}$

B. $\frac{-32}{75}$

C. $\frac{32}{75}$

D. $-\frac{8}{3}$

Answer:

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6. Simplify : $\left(\frac{3}{5} \times \frac{-15}{21}\right) + \left(\frac{-9}{14} + \frac{45}{28}\right) - \left(\frac{2}{3} \times \frac{30}{12}\right)$

A. $1\frac{17}{35}$

B. $-2\frac{52}{105}$

C. $-1\frac{4}{11}$

D. $\frac{-40}{41}$

Answer:

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7. There are three poles, A, B and C. The height of pole C is $\frac{2}{3}$ of pole B, the height of pole B is $\frac{4}{3}$ of the pole A. Find the height of pole C, if the height of pole A is $\frac{97}{3}m$.

A. $15\frac{10}{63}m$

B. $3\frac{17}{27}m$

C. $28\frac{20}{27}m$

D. $4\frac{20}{63}m$

Answer:

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8. The sum of the additive inverse and multiplicative inverse of 5 is

A. $\frac{24}{5}$

B. $\frac{-24}{5}$

C. $\frac{21}{5}$

D. $\frac{-21}{5}$

Answer:

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9. A rational number equivalent to $\frac{-7}{-4}$ is

A. $\frac{-42}{24}$

B. $\frac{-49}{28}$

C. $\frac{35}{20}$

D. None of these

Answer:

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10. What should be added to $\left(\frac{1}{2}+\frac{1}{3}-\frac{1}{5}\right)$ to get 3?

A. $\frac{-71}{30}$

B. $\frac{19}{10}$

C. $\frac{71}{30}$

D. $\frac{17}{15}$

Answer:

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11. $\left|\frac{2}{3}-\frac{3}{4}\right|$ is equal to

A. $\frac{-7}{12}$

B. $-\frac{1}{12}$

C. $\frac{1}{12}$

D. $\frac{17}{12}$

Answer:

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12. Choose the rational number which does not lie between rational numbers $-\frac{2}{5}$ and $-\frac{1}{5}$.

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

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

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

D. $-\frac{7}{20}$

Answer:

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13. Divide the sum of $\frac{4}{5}$ and $\frac{9}{15}$ by their difference.

A. 9

B. 7

C. 8

D. 6

Answer:

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14. The product of two rational numbers is $-\frac{13}{35}$. If one of them is $\frac{3}{7}$, then find the absolute value of the difference of two rational numbers.

A. $\frac{2}{35}$

B. $1\frac{31}{105}$

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

D. $\frac{46}{105}$

Answer:

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15. Absolute value of product of the sum of $\frac{17}{21}$ & $\frac{8}{7}$ and their difference, is

A. $\frac{41}{63}$

B. $\frac{17}{21}$

C. $\frac{24}{21}$

D. $\frac{41}{7}$

Answer:

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Exercise Match The Following

1. Match the following:

List-I		List-II	
(P)	Additive identity of a rational number 'a' is	(1)	$1/a$
(Q)	Multiplicative inverse of a rational number 'a' is	(2)	0
(R)	Multiplicative identity of a rational number 'a' is	(3)	$-a$
(S)	Additive inverse of a rational number 'a' is	(4)	1

A. P-2, Q-1, R-4, S-3

B. P-3, Q-2, R-4, S-1

C. P-3, Q-2, R-1, S-4

D. P-2, Q-4, R-3, S-1

Answer:

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2. Match the following:

List-I	List-II
(P) Associative law	(1) If a and b are rational numbers, then $a + b$ is a rational number.
(Q) Commutative law	(2) If a and b are rational numbers, then $a + b = b + a$
(R) Distributive law	(3) If a, b and c are rational numbers, then $a + (b + c) = (a + b) + c$
(S) Closure law	(4) If a, b and c are rational numbers, then $a \times (b + c) = ab + ac$

A. P-2, Q-3, R-4, S-1

B. P-3, Q-2, R-4, S-1

C. P-3, Q-2, R-1, S-4

D. P-2, Q-4, R-3, S-1

Answer:

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Exercise Assertion Reason Type

1. Assertion : Zero is a rational number.

Reason : Each rational number is a quotient of any two integers, while its divisor should not be zero. Thus, a number of the form $\frac{p}{q}$, where p and q are integers and q $\neq$ 0 is a rational number.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer:

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2. Assertion : For each rational number p/q, $q \neq 0$ is true.

Reason : Rational numbers are always positive.

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3. Assertion : If x, y, z be rational numbers such that x $>$ y and y $>$ z, then x $>$ z.

Reason : The sum of two rational numbers is always greater than third rational number.

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4. Which property is being depicted in the expression provided below: $\frac{5}{9}+\left[\frac{-4}{3}+\left(\frac{-9}{8}\right)\right]=\left[\frac{5}{9}+\left(\frac{-4}{3}\right)\right]-\frac{9}{8}$.

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5. Assertion : One of the rational number between $\frac{1}{5}$ and $\frac{1}{4}$ is $\frac{9}{2}$.

Reason : If x and y are any two rational numbers such that $x < y$, then $\frac{1}{2}(x+y)$ is a rational number between x and y such that $x < \frac{1}{2}(x+y) < y$.

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Exercise Comprehension Type Passage

1. $\frac{73}{-29}$ is the multiplicative inverse of _____.

A. $\frac{29}{73}$

B. $\frac{-29}{73}$

C. $\frac{73}{29}$

D. 1

Answer:

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2. Find the multiplicative inverse of $\frac{1}{2}\left(2+\frac{3}{2}\right)$

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

B. $\frac{8}{3}$

C. $\frac{7}{2}$

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

Answer:

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3. If $(x+y)z=1$, then z is a multiplicative inverse of _____.

A. x

B. y

C. $x+y$

D. $\frac{x+y}{2}$

Answer:

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4. If $\frac{a}{b} \times \left(\frac{c}{d} + \frac{e}{f}\right) = \frac{a}{b} \times \frac{c}{d} + \frac{a}{b} \times \frac{e}{f}$.

If $\frac{2}{3} \times \frac{-7}{10} + \frac{-2}{3} \times \frac{8}{9} = p \times \left[\frac{-7}{10} + q\right]$, then p and q are

A. $\frac{2}{3}, \frac{8}{9}$

B. $\frac{-2}{3}, \frac{-8}{9}$

C. $\frac{-2}{3}, \frac{8}{9}$

D. $\frac{2}{3}, \frac{-8}{9}$

Answer:

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5. ASSOCIATIVITY The multiplication of rational numbers is associative. That is if $\frac{a}{b} \frac{c}{d}$ and $\frac{e}{f}$ are three rational numbers then

$\left(\frac{a}{b} \times \frac{a}{d}\right) \times \frac{e}{f} = \frac{a}{b} \times \left(\frac{c}{d} \times \frac{e}{f}\right)$

A. Commutativity of multiplication over addition

B. Commutativity of addition over multiplication

C. Distributivity of multiplication over addition

D. Distributivity of addition over multiplication

Answer:

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6. If $\frac{a}{b} \times \left(\frac{c}{d} + \frac{e}{f}\right) = \frac{a}{b} \times \frac{c}{d} + \frac{a}{b} \times \frac{e}{f}$.

If $\frac{2}{5} \times \frac{-8}{9} + p \times \frac{5}{9} = \frac{2}{5} \times [q + r]$, then p, q and r are

A. $\frac{2}{5}, \frac{8}{9}, \frac{5}{9}$

B. $\frac{2}{5}, \frac{8}{9}, \frac{-5}{9}$

C. $\frac{-2}{5}, \frac{-8}{9}, \frac{-5}{9}$

D. $\frac{-2}{5}, \frac{-8}{9}, \frac{5}{9}$

Answer:

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Exercise Subjective Problems Very Short Answer Type

1. Write the additive inverse of each of the following rational numbers: $\frac{-17}{5}$ (ii) $\frac{-11}{-25}$

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2. Write the negative (additive inverse) of each of the following : $\frac{-5}{1}$ (ii) 0 (iii) 1 (iv) -1

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3. Fill in the blanks: $\frac{-4}{13} - \frac{-3}{26} =$ (ii) $\frac{-9}{14} + = -1$

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4. Multiply: $\frac{-2}{9} by \frac{5}{11}$ (ii) $\frac{-3}{17} by \frac{-5}{-4}$

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5. Express $\frac{2}{7}$ as a rational number whose numerator is -6.

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6. Express rational number $\frac{4}{-14}$ with positive denominator.

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7. Find the value of x, if $\frac{-5}{9} = \frac{10}{x}$.

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8. Are $\frac{15}{24}$ and $\frac{45}{48}$ equivalent rational numbers?

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9. Can you write $\frac{1}{2}$ with denominator equal to 4?

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10. Write the absolute value of $\frac{-9}{-100}$.

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11. Can -2 be the absolute value of any rational number?

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Exercise Subjective Problems Short Answer Type

1. Express $\frac{728}{-112}$ in standard form.

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2. Simplify : $\frac{-5}{9} \times \left(\frac{-10}{13}\right) \times \left(\frac{21}{11}\right) \times (-7)$

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3. If $\frac{3}{5}$ of a number exceeds its $\frac{2}{7}$ by 44, find the number.

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4. Verify that $|x \times y| = |x| \times |y|$ by taking $x = \frac{-3}{5}, y = \frac{-5}{3}$.

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5. Evaluate : $\frac{11}{15} + \frac{19}{10} + \frac{-9}{5} + \frac{-2}{5}$

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6. By what number should $\frac{-33}{16}$ be divided to get $\frac{-11}{4}$?

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7. Find $(x+y):(x-y)$, if $x=\frac{1}{2}, y=\frac{2}{3}$.

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8. Find a rational number between $-\frac{2}{3}$ and $\frac{1}{4}$

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9. The cost of $7\frac{2}{3}$ metres of rope is rs $12\frac{3}{4}$. Find the cost of cloth per metre.

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10. The product of two rational numbers is $\frac{63}{40}$. If one of the number is $\left(\frac{-7}{5}\right)$, find the other number.

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Exercise Subjective Problems Long Answer Type

1. Divide the sum of $\frac{-13}{5}$ and $\frac{12}{7}$ by the product of $\frac{-31}{7}$ and $\frac{-1}{2}$.

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2. Simplify: $\left(\frac{3}{11}x\frac{5}{6}\right) - \left(\frac{9}{12}x\frac{4}{3}\right) + \left(\frac{5}{13}x\frac{6}{15}\right)$

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3. Verity the property: $x \times (y+z) = x \times y + x \times z$ $by\ tak \in g$:

$x = \frac{-3}{7}, y = \frac{12}{13}, z = \frac{-5}{6}$ $x = \frac{-12}{5}, y = \frac{-15}{4}, z = \frac{8}{3}$

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4. Find four rational numbers between $\frac{2}{3} and \frac{4}{5}$.

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5. For $x = \frac{1}{2}$ and $y = \frac{2}{3}$, verify that $-(x + y) = (-x) + (-y)$.

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Exercise Integer Numerical Value Type

1. Write the unit digit of denominator of $(x + y) \times z$, where $x = \frac{-4}{3}, y = \frac{1}{2}, z = \frac{-7}{5}$.

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2. Write sum of numerator and denominator of simplest form of $\frac{360}{220}$.

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3. What is the multiplicative identity of rational number?

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4. Find the sum of digits of numerator and denominator of reciprocal of $\left(\frac{2}{5}+\frac{5}{4}\right)$

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5. The product of two numbers is $\frac{45}{56}$. One of them is 9/7 and the other number is m/n. Then $m+n$ is

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6. If $15\frac{2}{3} \times 3\frac{1}{6} + 6\frac{1}{3} = 11\frac{7}{8} + x$, then the denominator of x in simplest form is

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7. Denominator of $9\frac{3}{4} + 11\frac{1}{2} + 8\frac{1}{4}$ is

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8. The sum of two rational numbers is -3. If one of them is $\frac{-10}{3}$ then the other one is

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9. The product of a non-zero rational number and its reciprocal is _____.

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10. Find x, if $4 \times \frac{7}{9} = \frac{7}{9} \times x$.

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Olympiad Hots Corner

1. Simplify : $\frac{\left(\frac{2}{3} \times \left(-\frac{5}{4}\right)\right) + \left(\left(-\frac{10}{3}\right) \times \frac{5}{2}\right) - \left(\left(\frac{-16}{3}\right) \times \left(-\frac{55}{32}\right)\right)}{\frac{3}{2} \times \left(\left(-\frac{9}{14}\right) \times \left(-\frac{1}{7}\right)\right)}$

A. $\frac{1082}{81}$

B. $-\frac{1082}{81}$

C. $-133\frac{7}{81}$

D. $133\frac{7}{81}$

Answer:

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2. To reduce a rational number to its standard form, we divide its numerator and denominator by their

A. L.C.M.

B. H.C.F.

C. Product

D. Multiple

Answer:

Watch Video Solution

3. Which of the following is an example of distributive property of multiplication over addition for rational numbers.

A. $-\frac{3}{4} \times \left\{\frac{1}{3} + \left(-\frac{5}{7}\right)\right\} = \left[-\frac{3}{4} \times \frac{1}{3}\right] + \left[-\frac{3}{4} \times \left(-\frac{5}{7}\right)\right]$

B. $-\frac{3}{4} \times \left\{\frac{1}{3} + \left(-\frac{5}{7}\right)\right\} = \left[-\frac{3}{4} \times \frac{1}{3}\right] - \left[-\frac{5}{7}\right]$

C. $-\frac{3}{4} \times \left\{\frac{1}{3} + \left(-\frac{5}{7}\right)\right\} = \frac{1}{3} + \left[-\frac{3}{4}\right] \times \left(-\frac{5}{7}\right)$

D. $-\frac{3}{4} \times \left\{\frac{1}{3} + \left(-\frac{5}{7}\right)\right\} = \left[\frac{1}{3} + \left(-\frac{5}{7}\right)\right] - \frac{3}{4}$

Answer:

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4. If A: Rational numbers are always closed under division and R: Division by zero is not defined, then _____

A. Both A and R are true

B. Both A and R are false

C. A is true and R is false

D. A is false and R is true

Answer:

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5. ASSOCIATIVITY The addition of rational numbers is associative

A. $a + b = b + a$

B. $a + (b + c) = (a + b) + c$

C. $a \times (b \times c) = (a \times b) \times c$

D. $a + (b - c) = (a + b) - c$

Answer:

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6. Which of the following statements is true?

(i) $\frac{-5}{0}$ is a negative rational number.

(ii) The reciprocal of a, if $a \neq 0$ is $\frac{1}{a}$.

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

(iv) $x \div (y + z) = x \div y + x \div z$

A. Both (i) and (ii)

B. Only (iii)

C. (i), (ii) and (iv)

D. Only (ii)

Answer:

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7. Zero is _____.

A. The identity for addition of rational numbers.

B. The identity for subtraction of rational numbers.

C. The identity for multiplication of rational numbers.

D. The identity for division of rational numbers.

Answer:

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8. Which of the following statements is always true?

A. $\frac{x-y}{2}$ is a rational number between x and y.

B. $\frac{x+y}{2}$ is a rational number between x and y.

C. $\frac{x \times y}{2}$ is a rational number between x and y.

D. $\frac{x \div y}{2}$ is a rational number between x and y.

Answer:

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9. The numerical expression $\frac{3}{8} + \frac{(-5)}{7} = \frac{-19}{56}$ shows that

A. Rational numbers are closed under addition.

B. Rational numbers are not closed under addition.

C. Rational numbers are closed under multiplication.

D. Addition of rational numbers is not commutative.

Answer:

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10. Divide 34 in to two parts in such a way that $\left(\frac{4}{7}\right)^t h$ of one part is equal to $\left(\frac{2}{5}\right)th$ of the other

A. 20, 14

B. 21, 13

C. 13, 21

D. 14, 20

Answer:

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11. Which of the following rational numbers does not lie between $\frac{1}{4}$ and $\frac{2}{3}$?

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

B. $\frac{1}{3}$

C. $\frac{14}{24}$

D. $\frac{18}{24}$

Answer:

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12. The numerator and the denominator of a rational number are in the ratio 5:7. When 6 is added to both the numerator and denominator, the ratio becomes 4:5. What is the rational number?

A. $\frac{7}{5}$

B. $\frac{5}{7}$

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

D. $\frac{13}{14}$

Answer:

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13. A water pump pumps out $14\frac{1}{6}l$ water per minute from a reservoir. How many litres of water will be pumped out in $1\frac{1}{5}$ of an hour?

A. $1125l$

B. $6120l$

C. $1020l$

D. $1560l$

Answer:

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14. Subtract the sum of $\frac{-1}{2}$ and $\frac{-4}{7}$ from the sum of $\frac{3}{4}$ and $\frac{-5}{7}$.

A. $\frac{-33}{28}$

B. $\frac{31}{28}$

C. $\frac{1}{14}$

D. $\frac{-51}{28}$

Answer:

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15. Shruti uses $105\frac{1}{8}$g of flour for making $\frac{1}{2}$kg of halwa. How much halwa can she make from $315\frac{3}{8}$g of wheat flour?

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16. Find one rational number between $\frac{1}{5}$ and $\frac{1}{4}$

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17. Simple form of $\frac{1}{3-\frac{1}{2-\frac{1}{7}}}$ is

A. $\frac{13}{32}$

B. $\frac{32}{13}$

C. $\frac{7}{13}$

D. $\frac{13}{7}$

Answer:

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18. Every fraction is a rational number but a rational number need not be a fraction.

A. p is true and q is false.

B. p is false and q is true.

C. Both p and q are true.

D. Both p and q are false.

Answer:

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19. Which of the following numbers does not lie between -1 and -2?

A. $\frac{-16}{10}$

B. $\frac{-4}{5}$

C. $\frac{-15}{10}$

D. $\frac{-13}{10}$

Answer:

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20. Nine times the reciprocal of a rational number equals 6 times the reciprocal of 17. Find the rational number.

A. $11\frac{1}{3}$

B. $25\frac{1}{2}$

C. $10\frac{1}{3}$

D. None of these

Answer:

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