



MATHS

BOOKS - NCERT EXEMPLAR

RATIONAL NUMBERS

Solved Examples

1. In Examples 1 to 4, there are four options, out of which one is correct.

Choose the correct one.

Which of the following rational numbers is equivalent to $\frac{2}{3}$?

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

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

C. $\frac{4}{6}$

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

Answer: C



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2. there are four options, out of which one is correct.

Choose the correct one.

Which of the following rational numbers is in standard form?

A. $\frac{20}{30}$

B. $\frac{10}{4}$

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

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

Answer: C



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3. In Examples 1 to 4, there are four options, out of which one is correct.

Choose the correct one.

The sum of $\frac{-3}{2}$ and $\frac{1}{2}$ is

A. -1

B. -2

C. 4

D. 3

Answer: A



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4. In Examples 1 to 4, there are four options, out of which one is correct.

Choose the correct one.

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

A. -2

B. -3

C. 2

D. -1

Answer: D



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5. In Examples 5 and 6, fill in the blanks to make the statements true.

There are _____ number of rational numbers between two rational numbers.



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6. In Examples 5 and 6, fill in the blanks to make the statements true.

The rational number _____ is neither positive nor negative.



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7. state whether the statements are True or False.

In any rational number $\frac{p}{q}$, denominator is always a nonzero integer.



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8. state whether the statements are True or False.

"To reduce the rational number to its standard form, we divide its numerator and denominator by their HCF".



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9. state whether the statements are True or False.

“All rational numbers are integers”.



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10. List three rational numbers between $\frac{4}{5}$ and $\frac{5}{6}$.



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11. Which of the following pairs represent equivalent rational numbers ?

$\frac{7}{12}$ and $\frac{28}{48}$



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12. Which of the following pairs represent equivalent rational numbers ?

$$\frac{-2}{-3} \text{ and } \frac{-16}{24}$$



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13. Write four more rational numbers to complete the pattern:

$$\frac{-1}{3}, \frac{-2}{6}, \frac{-3}{9}, \text{---}, \text{---}, \text{---}, \text{---}.$$



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14. Find the sum of $-4\frac{5}{6}$ and $-7\frac{3}{4}$.



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15. Find the product of $-2\frac{3}{4}$ and $5\frac{6}{7}$.



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16. Match column I to column II in the following:

Column I

Column II

(i) $\frac{3}{4} \div \frac{3}{4}$

(a) -1

(ii) $\frac{1}{2} \div \frac{4}{4}$

(b) $\frac{-2}{3}$

(iii) $\frac{2}{3} \div (-1)$

(c) $\frac{3}{2}$

(iv) $\frac{3}{4} \div \frac{1}{2}$

(d) $\frac{3}{8}$

(v) $\frac{5}{7} \div \left(\frac{-5}{7}\right)$

(e) 1



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17. Find the reciprocal of $\frac{2}{11} + -\frac{5}{55}$.



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Exercise

1. A rational number is defined as a number that can be expressed in the form $\frac{p}{q}$, where p and q are integers and

A. $q = 0$

B. $q = 1$

C. $q \neq 1$

D. $q \neq 0$

Answer:



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2. Which of the following rational numbers is positive?

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

B. $\frac{19}{-13}$

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

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

Answer:



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3. Which of the following rational numbers is negative?

A. $-\left(\frac{-3}{7}\right)$

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

C. $\frac{9}{8}$

D. $\frac{3}{-7}$

Answer:



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4. In the standard form of a rational number, the common factor of numerator and denominator is always:

A. 0

B. 1

C. -2

D. 2

Answer:



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5. Which of the following rational numbers is equal to its reciprocal?

A. 1

B. 2

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

D. 0

Answer:



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6. The reciprocal of $\frac{1}{2}$ is

A. 3

B. 2

C. -1

D. 0

Answer:



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7. The standard form of $\frac{-48}{60}$ is

A. $\frac{48}{60}$

B. $\frac{-60}{48}$

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

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

Answer:



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8. Which of the following is equivalent to $\frac{4}{5}$?

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

B. $\frac{16}{25}$

C. $\frac{16}{20}$

D. $\frac{15}{25}$

Answer:



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9. How many rational numbers are there between two rational numbers?

A. 1

B. 0

C. unlimited

D. 100

Answer:



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10. In the standard form of a rational number, the denominator is always a

A. 0

B. negative integer

C. positive integer

D. 1

Answer: C



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

A. LCM

B. HCF

C. product

D. multiple

Answer: B



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12. Which is greater number in the following:

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

B. 0

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

D. -2

Answer: C



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13. fill in the blanks to make the statements true.

$-\frac{3}{8}$ is a _____ rational number.



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14. fill in the blanks to make the statements true.

1 is a _____ rational number.



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15. fill in the blanks to make the statements true.

The standard form of $\frac{-8}{-36}$ is _____ .



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16. fill in the blanks to make the statements true.

The standard form of $\frac{18}{-24}$ is ____ .



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17. fill in the blanks to make the statements true.

On a number line, $\frac{-1}{2}$ is to the ____ of zero (0).



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18. fill in the blanks to make the statements true.

On a number line, $\frac{4}{3}$ is to the ___ of zero (0).



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19. fill in the blanks to make the statements true.

$$-\frac{1}{2} \text{ is } \underline{\hspace{2cm}} \text{ than } \frac{1}{5}.$$



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20. fill in the blanks to make the statements true.

$$-\frac{3}{5} \text{ is } \underline{\hspace{1cm}} \text{ than } 0.$$



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21. fill in the blanks to make the statements true.

$\frac{-16}{24}$ and $\frac{20}{-16}$ represent _____ rational numbers.



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22. fill in the blanks to make the statements true.

$\frac{-27}{45}$ and $\frac{-3}{5}$ represent _____ rational numbers.



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23. fill in the blanks to make the statements true.

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



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24. fill in the blanks to make the statements true.

$$\frac{-3}{5} + \frac{2}{5} = \text{_____} .$$



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25. fill in the blanks to make the statements true.

$$\frac{-5}{6} + \frac{-1}{6} = \text{-----}.$$



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26. fill in the blanks to make the statements true.

$$\frac{3}{4} \times \left(\frac{-2}{3} \right) = \text{-----}.$$



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27. fill in the blanks to make the statements true.

$$\frac{-5}{3} \times \left(\frac{-3}{5} \right) = \text{-----} .$$



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28. fill in the blanks to make the statements true.

$$\frac{-6}{7} = \frac{\text{---}}{42}$$



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29. fill in the blanks to make the statements true.

$$\frac{1}{2} = \frac{6}{\quad}$$



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30. fill in the blanks to make the statements true.

$$\frac{-2}{9} - \frac{7}{9} = \text{-----}.$$



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31. fill in the boxes with the correct symbol >,<

or =.

$$\frac{7}{-8} \square \frac{8}{9}$$



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32. fill in the boxes with the correct symbol >,<

or =.

$$\frac{3}{7} \square \frac{-5}{6}$$



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33. fill in the boxes with the correct symbol $>$, $<$

or $=$.

$$\frac{5}{6} \square \frac{8}{4}$$



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34. fill in the boxes with the correct symbol $>$, $<$

or $=$.

$$\frac{-9}{7} \square \frac{4}{-7}$$



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35. fill in the boxes with the correct symbol $>$, $<$

or $=$.

$$\frac{8}{8} \square \frac{2}{2}$$



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36. The reciprocal of _____ does not exist.



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37. The reciprocal of 1 is _____.





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$$38. \frac{-3}{7} \div \left(\frac{-7}{3} \right) = \text{-----}.$$



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$$39. 0 \div \left(\frac{-5}{6} \right) = \text{-----}.$$



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$$40. 0 \times \left(\frac{-5}{6} \right) = \text{-----}.$$



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41. _____ $\times \left(\frac{-2}{5} \right) = 1.$



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42. The standard form of rational number -1 is _____.



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43. If m is a common divisor of a and b , then

$$\frac{a}{b} = \frac{a \div m}{\quad}$$



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44. If p and q are positive integers, then $\frac{p}{q}$ is a _____ rational number and $(p)(-q)$ is a _____ rational number.



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45. Two rational numbers are said to be equivalent or equal, if they have the same _____ form.



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46. If $\frac{p}{q}$ is a rational number, then q cannot be _____.



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47. State whether the statements given are True or False.

Every natural number is a rational number but every rational number need not be a natural number.



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48. State whether the statements given are True or False.

Zero is a rational number.





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49. State whether the statements given are True or False.

Every integer is a rational number but every rational number need not be an integer.



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50. State whether the statements given are True or False.

Every negative integer is not a negative rational number.



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51. State whether the statements given are True or False.

If $\frac{p}{q}$ is a rational number and m is a non-zero

integer, then $\frac{p}{q} = \frac{p \times m}{q \times m}$



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52. State whether the statements give are True or False.

If $\frac{p}{q}$ is a rational number and m is a non-zero common divisor of p and q , then $\frac{p}{q} = \frac{p \div m}{q \div m}$



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53. State whether the statements given are True or False.

In a rational number, denominator always has to be a non-zero integer.





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54. State whether the statements given are True or False.

If $\frac{p}{q}$ is a rational number and m is a non-zero integer, then $\frac{p \times m}{q \times m}$ is a rational number not equivalent to $\frac{p}{q}$.



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55. State whether the statements given are True or False.

Sum of two rational numbers is always a rational number.



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56. State whether the statements given are True or False.

All decimal numbers are also rational numbers.



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57. State whether the statements given are True or False.

The quotient of two rationals is always a rational number.



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58. State whether the statements given are True or False.

Every fraction is a rational number.



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59. State whether the statements given are True or False.

Two rationals with different numerators can never be equal.



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60. State whether the statements given are True or False.

8 can be written as a rational number with any integer as denominator.



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61. State whether the statements given are True or False.

$\frac{4}{6}$ is equivalent to $\frac{2}{3}$.



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62. State whether the statements given are True or False.

The rational number $\frac{-3}{4}$ lies to the right of zero on the number line.



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63. State whether the statements given are True or False.

The rational numbers $\frac{-12}{-5}$ and $\frac{-7}{17}$ are on the opposite sides of zero on the number line.



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64. State whether the statements given are True or False.

Every rational number is a whole number.



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65. State whether the statements given are True or False.

Zero is the smallest rational number.



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66. Match the following:

Column I

Column II

(i) $\frac{a}{b} \div \frac{a}{b}$

(a) $\frac{-a}{b}$

(ii) $\frac{a}{b} \div \frac{c}{d}$

(b) -1

(iii) $\frac{a}{b} \div (-1)$

(c) 1

(iv) $\frac{a}{b} \div \frac{-a}{b}$

(d) $\frac{bc}{ad}$

(v) $\frac{b}{a} \div \left(\frac{d}{c}\right)$

(e) $\frac{ad}{bc}$



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67. Write each of the following rational numbers with positive denominators:

$$\frac{5}{-18}, \frac{15}{-28}, \frac{-17}{-13}$$



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68. Express $\frac{3}{4}$ as a rational number with denominator:

36



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69. Express $\frac{3}{4}$ as a rational number with denominator:

-80



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70. Reduce each of the following rational numbers in its lowest form:

$$\frac{-60}{72}$$



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71. Reduce each of the following rational numbers in its lowest form:

$$\frac{91}{-364}$$



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72. Express each of the following rational numbers in its standard form:

$$\frac{-12}{-30}$$



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73. Express each of the following rational numbers in its standard form:

$$\frac{14}{-49}$$



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74. Express each of the following rational numbers in its standard form:

$$\frac{-15}{35}$$



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75. Express each of the following rational numbers in its standard form:

$$\frac{299}{-161}$$



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76. Are the rational numbers $\frac{-8}{28}$ and $\frac{32}{-112}$

equivalent? Give reason.



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77. Arrange the rational numbers

$\frac{-7}{10}$, $\frac{5}{-8}$, $\frac{2}{-3}$, $\frac{-1}{4}$, $\frac{-3}{5}$ in ascending

order.



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78. Represent the following rational numbers

on a number line: $\frac{3}{8}$, $\frac{-7}{3}$, $\frac{22}{-6}$.



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79. If $\frac{-5}{7} = \frac{x}{28}$, find the value of x .



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80. Give three rational numbers equivalent to:

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



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81. Give three rational numbers equivalent to:

$$\frac{7}{11}$$



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82. Write the next three rational numbers to complete the pattern:

$$\frac{4}{-5}, \frac{8}{-10}, \frac{12}{-15}, \frac{16}{-20}, \text{-----}, \text{-----}, \text{-----}.$$



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83. Write the next three rational numbers to complete the pattern:

$$\frac{-8}{7}, \frac{-16}{14}, \frac{-24}{21}, \frac{-32}{28}, \text{---}, \text{---}, \text{---}.$$



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84. List four rational numbers between

$$\frac{5}{7} \text{ and } \frac{7}{8}.$$



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85. Find the sum of

$$\frac{8}{13} \text{ and } \frac{3}{11}$$



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86. Find the sum of

$$\frac{7}{3} \text{ and } \frac{-4}{3}$$



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87. Solve:

$$\frac{29}{4} - \frac{30}{7}$$



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88. Solve:

$$\frac{5}{13} - \frac{-8}{26}$$



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89. Find the product of:

$$\frac{-4}{5} \text{ and } \frac{-5}{12}$$



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90. Find the product of:

$$\frac{-22}{11} \text{ and } \frac{-21}{11}$$



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91. Simplify:

$$\frac{13}{11} \times \frac{-14}{5} + \frac{13}{11} \times \frac{-7}{5}$$



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92. Simplify:

$$\frac{6}{5} \times \frac{3}{7} - \frac{1}{5} \times \frac{3}{7}$$



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93. Simplify:

$$\frac{3}{7} \div \left(\frac{21}{-55} \right)$$



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94. Simplify:

$$1 \div \left(-\frac{1}{2} \right)$$



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95. Which is greater in the following?

$$\frac{3}{4}, \frac{7}{8}$$



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96. Which is greater in the following?

$$-3\frac{5}{7}, 3\frac{1}{9}$$



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97. Write a rational number in which the numerator is less than -7×11 and the denominator is greater than $12 + 4$.



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98. If $x = \frac{1}{10}$ and $y = \frac{-3}{8}$. then evaluate $x + y$, $x - y$, $x \times y$ and $x \div y$.



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99. Find the reciprocal of the following:

$$\left(\frac{1}{2} \times \frac{1}{4}\right) + \left(\frac{1}{2} \times 6\right)$$



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100. Find the reciprocal of the following:

$$\frac{20}{51} \times \frac{4}{91}$$



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101. Find the reciprocal of the following:

$$\frac{3}{13} \div \frac{-4}{65}$$



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102. Find the reciprocal of the following:

$$\left(-5 \times \frac{12}{15} \right) - \left(-3 \times \frac{2}{9} \right)$$



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103. Complete the following table by finding the sums:

$+$	$-\frac{1}{9}$	$\frac{4}{11}$	$-\frac{5}{6}$
$\frac{2}{3}$			
$-\frac{5}{4}$		$\frac{-39}{44}$	
$-\frac{1}{3}$			



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104. Write each of the following numbers in the form $\frac{p}{q}$, where p and q are integers:

six-eighths



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105. Write each of the following numbers in the form $\frac{p}{q}$, where p and q are integers:

three and half



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106. Write each of the following numbers in the form $\frac{p}{q}$, where p and q are integers:

opposite of 1



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107. Write each of the following numbers in the form $\frac{p}{q}$, where p and q are integers:

one-fourth



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108. Write each of the following numbers in the form $\frac{p}{q}$, where p and q are integers:

zero



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109. Write each of the following numbers in the form $\frac{p}{q}$, where p and q are integers:

opposite of three-fifths



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110. If $p = m \times t$ and $q = n \times t$, then

$$\frac{p}{q} = \frac{\square}{\square}$$



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111. Given that $\frac{p}{q}$ and $\frac{r}{s}$ are two rational numbers with different denominators and both of them are in standard form. To compare these rational numbers we say that:

$$\frac{\square}{\square} < \frac{\square}{\square} . \text{ If } p \times s < r \times q$$



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112. Given that $\frac{p}{q}$ and $\frac{r}{s}$ are two rational numbers with different denominators and both of them are in standard form. To

compare these rational numbers we say that:

$$\frac{p}{q} = \frac{r}{s}, \text{ if } \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$



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113. Given that $\frac{p}{q}$ and $\frac{r}{s}$ are two rational numbers with different denominators and both of them are in standard form. To compare these rational numbers we say that:

$$\frac{\square}{\square} > \frac{\square}{\square}, \text{ if } p \times s > r \times q$$



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114. In each of the following cases, write the rational number whose numerator and denominator are respectively as under:

$$5 - 39 \text{ and } 54 - 6$$



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115. In each of the following cases, write the rational number whose numerator and denominator are respectively as under:

$$(-4) \times 6 \text{ and } 8 \div 2$$



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116. In each of the following cases, write the rational number whose numerator and denominator are respectively as under:

$$35 \div (-7) \text{ and } 35 - 18$$



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117. In each of the following cases, write the rational number whose numerator and denominator are respectively as under:

denominator are respectively as under:

$$25 + 15 \text{ and } 81 \div 40$$



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118. Write the following as rational numbers in their standard forms:

$$35\%$$



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119. Write the following as rational numbers in their standard forms:

1.2



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120. Write the following as rational numbers in their standard forms:

$$-6\frac{3}{7}$$



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121. Write the following as rational numbers in their standard forms:

$$240 \div (-840)$$



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122. Write the following as rational numbers in their standard forms:

$$115 \div 207$$



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123. Find a rational number exactly halfway

between:

$$\frac{-1}{3} \text{ and } \frac{1}{3}$$



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124. Find a rational number exactly halfway

between:

$$\frac{1}{6} \text{ and } \frac{1}{9}$$



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125. Find a rational number exactly halfway between:

$$\frac{5}{-13} \text{ and } \frac{-7}{9}$$



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126. Find a rational number exactly halfway between:

$$\frac{1}{15} \text{ and } \frac{1}{12}$$



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127. Taking $x = \frac{-4}{9}$, $y = \frac{5}{12}$ and $z = \frac{7}{18}$,

find:

the rational number which when added to x gives y .



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128. Taking $x = \frac{-4}{9}$, $y = \frac{5}{12}$ and $z = \frac{7}{18}$,

find:

the rational number which subtracted from y gives z .



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129. Taking $x = \frac{-4}{9}$, $y = \frac{5}{12}$ and $z = \frac{7}{18}$,

find:

the rational number which when added to z gives us x .



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130. Taking $x = \frac{-4}{9}$, $y = \frac{5}{12}$ and $z = \frac{7}{18}$,

find:

the rational number which when multiplied by y to get x .



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131. Taking $x = \frac{-4}{9}$, $y = \frac{5}{12}$ and $z = \frac{7}{18}$,

find:

the reciprocal of $x + y$.



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132. Taking $x = \frac{-4}{9}$, $y = \frac{5}{12}$ and $z = \frac{7}{18}$,

find:

the sum of reciprocals of x and y .



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133. Taking $x = \frac{-4}{9}$, $y = \frac{5}{12}$ and $z = \frac{7}{18}$,

find:

$$(x \div y) \times z$$



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134. Taking $x = \frac{-4}{9}$, $y = \frac{5}{12}$ and $z = \frac{7}{18}$,

find:

$$(x - y) + z$$



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135. Taking $x = \frac{-4}{9}$, $y = \frac{5}{12}$ and $z = \frac{7}{18}$,

find:

$$x + (y + z)$$



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136. Taking $x = \frac{-4}{9}$, $y = \frac{5}{12}$ and $z = \frac{7}{18}$,

find:

$$x \div (y \div z)$$



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137. Taking $x = \frac{-4}{9}$, $y = \frac{5}{12}$ and $z = \frac{7}{18}$,

find:

$$x - (y + z)$$



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138. What should be added to $\frac{-1}{2}$ to obtain the nearest natural number?



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139. What should be subtracted from $\frac{-2}{3}$ to obtain the nearest integer?



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140. What should be multiplied with $\frac{-5}{8}$ to obtain the nearest integer?



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141. What should be divided by $\frac{1}{2}$ to obtain the greatest negative integer?



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142. From a rope 68 m long, pieces of equal size are cut. If length of one piece is $4\frac{1}{4}$ m, find the number of such pieces.



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143. If 12 shirts of equal size can be prepared from 27m cloth, what is length of cloth required for each shirt?



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144. Insert 3 equivalent rational numbers between

$$\frac{-1}{2} \text{ and } \frac{1}{5}$$



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145. Insert 3 equivalent rational numbers between

$$0 \text{ and } -10$$



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146. Put the (right tick), wherever applicable

Number	Natural Number	Whole Number	Integer	Fraction	Rational Number
(a) - 114					
(b) $\frac{19}{27}$					
(c) $\frac{623}{1}$					
(d) $-19\frac{3}{4}$					
(e) $\frac{73}{71}$					
(f) 0					



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147. 'a' and 'b' are two different numbers taken from the numbers 1 - 50. What is the largest

value that $\frac{a - b}{a + b}$ can have? What is the

largest value that $\frac{a + b}{a - b}$ can have?



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148. 150 students are studying English, Maths or both. 62 per cent of the students are studying English and 68 per cent are studying Maths. How many students are studying both?



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149. A body floats $\frac{2}{9}$ of its volume above the surface. What is the ratio of the body

submerged volume to its exposed volume? Rewrite it as a rational number.



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150. Find the odd one out of the following and give reason.

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

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

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

D. $\frac{-1}{3} \times \frac{3}{1}$

Answer:



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151. Find the odd one out of the following and give reason.

A. $\frac{4}{-9}$

B. $\frac{-16}{36}$

C. $\frac{-20}{-45}$

D. $\frac{28}{-63}$

Answer:



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152. Find the odd one out of the following and give reason.

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

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

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

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

Answer:



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153. Find the odd one out of the following and give reason.

A. $\frac{-3}{7}$

B. $\frac{-9}{15}$

C. $\frac{+24}{20}$

D. $\frac{+35}{25}$

Answer:



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154. What's the Error? Chhaya simplified a rational number in this manner $\frac{-25}{-30} = \frac{-5}{6}$.

What error did the student make?



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Think And Discuss

1. Give an example of two or more rational numbers whose denominators with no common factors.



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2. Tell if $-2\frac{1}{5} - \left(-2\frac{3}{16}\right)$ is positive or negative. Explain.



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3. Explain how to add $2\frac{2}{5} + 9\frac{1}{2}$, without first writing them as improper fractions.



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4. Explain how you can be sure that a fraction is simplified.



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5. Give the sign of a rational number in which the numerator is negative and the denominator is negative.

A. negative

B. positive

C. can not determine

D. none of the above

Answer: B



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6. Can you find the reciprocal of $\frac{2}{11} \times \frac{5}{55}$?



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7. find the reciprocal of $\frac{2}{11} \times \frac{5}{55}$

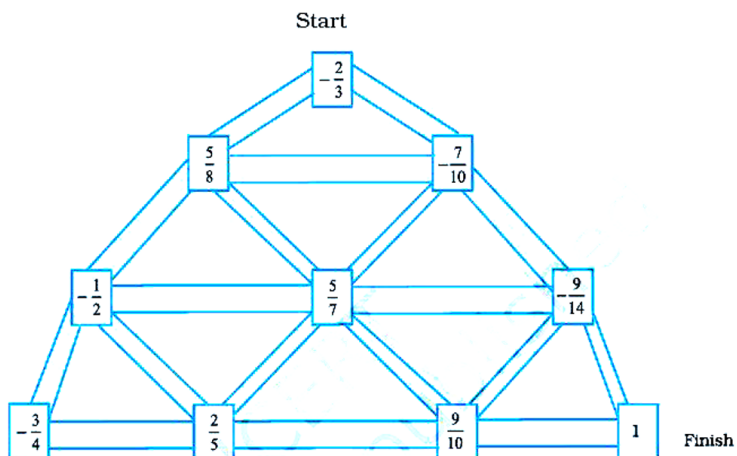
Can you compare it's reciprocal with the original number?



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Application

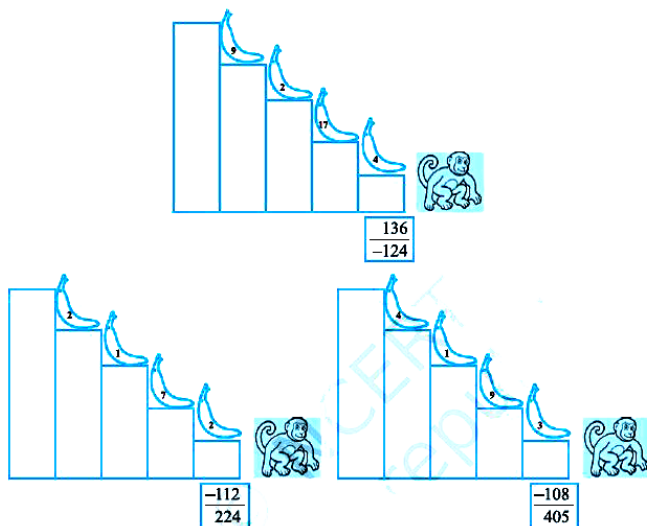
1. Moving from start to finish by going from smaller to bigger rational numbers.



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2. Three monkeys are climbing upstairs. They can only move ahead if they eat a banana with

the common factor of their numerator and denominator on it. Which of the three monkeys will be able to reach till the end?



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