



MATHS

BOOKS - NCERT EXEMPLAR

RATIONAL NUMBERS

Example Choose The Correct Answer

1. Which of the following is not true?

A. $\frac{2}{3} + \frac{5}{4} = \frac{5}{4} + \frac{2}{3}$

B. $\frac{2}{3} - \frac{5}{4} = \frac{5}{4} - \frac{2}{3}$

C. $\frac{2}{3} \times \frac{5}{4} = \frac{5}{4} \times \frac{2}{3}$

D. $\frac{2}{3} \div \frac{5}{4} = \frac{2}{3} \times \frac{4}{5}$

Answer: B



2. Multiplicative inverse of $\frac{0}{1}$ is

- A. 1
- B. -1
- C. 0
- D. not defined

Answer: D



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3. Three rational numbers lying between $\frac{-3}{4}$ and $\frac{1}{2}$ are

- A. $-\frac{1}{2}, 0, \frac{3}{4}$
- B. $\frac{-1}{4}, \frac{1}{4}, \frac{3}{4}$
- C. $\frac{-1}{4}, 0, \frac{1}{4}$

D. $-\frac{5}{4}, 0, \frac{1}{4}$

Answer: C



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Example Fill In The Blanks

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



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2. If $x = \frac{1}{3}$ and $y = \frac{6}{7}$ then $xy = \frac{y}{x} = \underline{\hspace{2cm}}$.



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Example True Or False

1. Every rational number has a reciprocal.



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2. $\frac{-4}{5}$ is larger than $\frac{-5}{4}$.



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Example

1. Find $\frac{4}{7} \times \frac{14}{3} \div \frac{2}{3}$



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2. Using appropriate properties, find $\frac{2}{3} \times \frac{-5}{7} + \frac{7}{3} + \frac{2}{3} \times \frac{-2}{7}$.



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3. Let O, P and Z represent the numbers 0, 3 and -5 respectively on the number line. Points Q, R and S are between O and P such that $OQ = QR = RS = SP$.

What are the rational numbers represented by the points Q, R and S. Next choose a point T between Z and O so that $ZT = TO$. Which rational number does T represent?



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4. A farmer has a field of area $49\frac{4}{5}$ ha. He wants to divide it equally among his one son and two daughters. Find the area of each one's share.
(ha means hectare, 1 hectare = 10,000 m^2)



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5. Let a, b, c be the three rational numbers where $a = \frac{2}{3}$, $b = \frac{4}{5}$ and $c = -\frac{5}{6}$

Verify:

(i) $a + (b + c) = (a + b) + c$ (Associative property of addition)

(ii) $a \times (b \times c) = (a \times b) \times c$ (Associative property of multiplication)

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6. Solve the following questions and write your observations.

$$\frac{5}{3} + 0 = ?$$

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7. Solve the following questions and write your observations.

$$\frac{-2}{5} + 0 = ?$$

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8. Solve the following questions and write your observations.

$$\frac{3}{7} + 0 = ?$$

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9. Solve the following questions and write your observations.

$$\frac{2}{3} \times 1 = ?$$



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10. Solve the following questions and write your observations.

$$\frac{-6}{7} \times 1 = ?$$



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11. Solve the following questions and write your observations.

$$\frac{9}{8} \times 1 = ?$$



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12. Write any 5 rational numbers between $\frac{-5}{6}$ and $\frac{7}{8}$.

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13. Identify the rational number which is different from the other three :

$\frac{2}{3}$, $\frac{-4}{5}$, $\frac{1}{2}$, $\frac{1}{3}$. Explain your reasoning.

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Example Problem Solving Strategies

1. The product of two rational numbers is -7 . If one of the number is -10 , find the other.

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Exercise Choose The Correct Answer

1. A number which can be expressed as $\frac{p}{q}$ where p and q are integers and $q \neq 0$ is

A. natural number

B. whole number

C. integer

D. rational number

Answer:

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2. A number of the form $\frac{p}{q}$ is said to be a rational number if

A. p and q are integers.

B. p and q are integers and $q \neq 0$

C. p and q are integers and $p \neq 0$

D. p and q are integers and $p \neq 0$ also $q \neq 0$.

Answer: B

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3. 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: A



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4. Which of the following is not true?

- A. rational numbers are closed under addition
- B. rational numbers are closed under subtraction
- C. rational numbers are closed under multiplication.

D. rational numbers are closed under division.

Answer:

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5. $-\frac{3}{8} + \frac{1}{7} = \frac{1}{7} + \left(-\frac{3}{8}\right)$ is an example to show that

A. addition of rational numbers is commutative

B. rational numbers are closed under addition.

C. addition of rational number is associative.

D. rational numbers are distributive under addition.

Answer: A

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6. Which of the following expressions shows that rational numbers are associative under multiplication

A. $\frac{2}{3} \times \left(\frac{-6}{7} \times \frac{3}{5} \right) = \left(\frac{2}{3} \times \frac{-6}{7} \right) \times \frac{3}{5}$

B. $\frac{2}{3} \times \left(\frac{-6}{7} \times \frac{3}{5} \right) = \frac{2}{3} \times \left(\frac{3}{5} \times \frac{-6}{7} \right)$

C. $\frac{2}{3} \times \left(\frac{-6}{7} \times \frac{3}{5} \right) = \left(\frac{3}{5} \times \frac{2}{3} \right) \times \frac{-6}{7}$

D. $\left(\frac{2}{3} \times \frac{-6}{7} \right) \times \frac{3}{5} = \left(\frac{-6}{7} \times \frac{2}{3} \right) \times \frac{3}{5}$

Answer:



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7. Zero (0) 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: A



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8. One (1) 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: C



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9. The additive inverse of $\frac{-7}{19}$ is

A. $\frac{-7}{19}$

B. $\frac{7}{19}$

C. $\frac{19}{7}$

D. $\frac{-19}{7}$

Answer: B



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10. Multiplicative inverse of a negative rational number is

A. a positive rational number.

B. a negative rational number

C. 0

D. 1

Answer: B



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11. If $x + 0 = 0 + x = x$, which is rational number, then 0 is called

- A. identity for addition of rational numbers.
- B. additive inverse of x .
- C. multiplicative inverse of x .
- D. reciprocal of x .

Answer:



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12. To get the product 1, we should multiply $\frac{8}{21}$ by

- A. $\frac{8}{21}$
- B. $\frac{-8}{21}$
- C. $\frac{21}{8}$
- D. $\frac{-21}{8}$

Answer:



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13. $-(-x)$ is same as

A. $-x$

B. x

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

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

Answer:



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14. The multiplicative inverse of $-1\frac{1}{7}$ is

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

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

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

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

Answer: D



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15. If x be any rational number then $x + 0$ is equal to

A. x

B. 0

C. $-x$

D. Not defined

Answer:



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16. $v_{20.1}$

A. 1

B. -1

C. 0

D. Not defined

Answer:



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17. The reciprocal of -1 is

A. 1

B. -1

C. 0

D. Not defined

Answer:



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18. The reciprocal of 0 is

A. 1

B. -1

C. 0

D. Not defined

Answer:



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19. The reciprocal of any rational number $\frac{p}{q}$, where p and q are integers and $q \neq 0$, is

A. $\frac{p}{q}$

B. 1

C. 0

D. $\frac{q}{p}$

Answer:



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20. If y be the reciprocal of rational number x , then the reciprocal of y will be

A. x

B. y

C. $\frac{x}{y}$

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

Answer:

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21. The reciprocal of $\frac{-3}{8} \times \left(\frac{-7}{13}\right)$ is

A. $\frac{104}{21}$

B. $\frac{-104}{21}$

C. $\frac{21}{104}$

D. $\frac{-21}{104}$

Answer:

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

A. $-\frac{1}{4} \times \left\{ \frac{2}{3} + \left(\frac{-4}{7}\right) \right\} = \left[-\frac{1}{4} \times \frac{2}{3} \right] + \left[-\frac{1}{4} \times \left(\frac{-4}{7}\right) \right]$

B. $-\frac{1}{4} \times \left\{ \frac{2}{3} + \left(\frac{-4}{7}\right) \right\} = \left[\frac{1}{4} \times \frac{2}{3} \right] - \left(\frac{-4}{7}\right)$

$$C. -\frac{1}{4} \times \left\{ \frac{2}{3} + \left(\frac{-4}{7} \right) \right\} = \frac{2}{3} + \left(-\frac{1}{4} \right) \times \frac{-4}{7}$$

$$D. -\frac{1}{4} \times \left\{ \frac{2}{3} + \left(\frac{-4}{7} \right) \right\} = \left\{ \frac{2}{3} + \left(\frac{-4}{7} \right) \right\} - \frac{1}{4}$$

Answer:



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23. Between two given rational numbers, we can find

- A. one and only one rational number.
- B. only two rational numbers.
- C. only ten rational numbers
- D. infinitely many rational numbers.

Answer:



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24. $\frac{x + y}{2}$ is a rational number.

- A. Between x and y
- B. Less than x and y both
- C. Greater than x and y both
- D. Less than x but greater than y

Answer: A



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25. 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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Exercise Fill In The Blanks

1. The equivalent of $\frac{5}{7}$, whose numerator is 45 is _____.

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2. The equivalent rational number of $\frac{7}{9}$, whose denominator is 45 is _____.

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3. Between the numbers $\frac{15}{20}$ and $\frac{35}{40}$, the greater number is _____.

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4. The reciprocal of a positive rational number is _____.



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5. The reciprocal of a negative rational number



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6. Fill in the blanks:

(i) The product of a rational number and its reciprocal is

(ii) Zero has reciprocal.

(iii) The numbers and are their own reciprocals.

(iv) Zero is the reciprocal of any number.

(v) The reciprocal of a , where $a \neq 0$, is

(vi) The reciprocal of $\frac{1}{a}$, where $a \neq 0$, is

(vii) The reciprocal of a positive rational number is

(viii) The reciprocal of a negative rational number is

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7. Fill in the blanks:

- (i) The product of a rational number and its reciprocal is
- (ii) Zero has reciprocal.
- (iii) The numbers and are their own reciprocals.
- (iv) Zero is the reciprocal of any number.
- (v) The reciprocal of a , where $a \neq 0$, is
- (vi) The reciprocal of $\frac{1}{a}$, where $a \neq 0$, is
- (vii) The reciprocal of a positive rational number is
- (viii) The reciprocal of a negative rational number is

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8. If y be the reciprocal of x , then the reciprocal of y^2 in terms of x will be _____.

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9. The reciprocal of $\frac{2}{5} \times \left(\frac{-4}{9}\right)$ is _____.

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10. $(213 \times 657)^{-1} = 213^{-1} \times$ _____.

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11. The negative of 1 is _____.

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12. For rational numbers $\frac{a}{b}$, $\frac{c}{d}$ and $\frac{e}{f}$ we have $\frac{a}{b} \times \left(\frac{c}{d} + \frac{e}{f}\right) =$
_____ + _____.

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13. $\frac{-5}{7}$ is _____ than -3.



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14. There are _____ rational numbers between any two rational numbers.



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15. The rational numbers $\frac{1}{3}$ and $\frac{-1}{3}$ are on the _____ sides of zero on the number line.



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16. The negative of a negative rational number is always a _____ rational number



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17. Rational numbers can be added or multiplied in any _____.



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18. The reciprocal of $\frac{-5}{7}$ is _____.



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19. The multiplicative inverse of $\frac{4}{3}$ is _____.



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20. The rational number 10.11 in the form $\frac{p}{q}$ is _____.



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21. $\frac{1}{5} \times \left[\frac{2}{7} + \frac{3}{8} \right] = \left[\frac{1}{5} \times \frac{2}{7} \right] + \text{-----}$.



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22. The two rational numbers lying between -2 and -5 with denominator as 1 are _____ and _____.



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Exercise True T Or False F

1. If $\frac{x}{y}$ is a rational number, then y is always a whole number.



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2. If $\frac{p}{q}$ is a rational number, then p cannot be equal to zero.



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3. If $\frac{r}{s}$ is a rational number, then s cannot be equal to zero.

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4. $\frac{5}{6}$ lies between $\frac{2}{3}$ and 1. True or false.

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5. $\frac{5}{10}$ lies between $\frac{1}{2}$ and 1. True or false.

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6. $\frac{-7}{2}$ lies between -3 and -4. True or false.

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7. $\frac{9}{6}$ lies between 1 and 2. True or false.

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8. If $a \neq 0$, the multiplicative inverse of $\frac{a}{b}$ is $\frac{b}{a}$.

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9. The multiplicative inverse of $\frac{-3}{5}$ is $\frac{5}{3}$.

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10. The additive inverse of $\frac{1}{2}$ is -2. True or false.

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11. If $\frac{x}{y}$ is the additive inverse of $\frac{c}{d}$, then $\frac{x}{y} + \frac{c}{d} = 0$. True or false.



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12. Write the negation of each of the following statements: For every real number x , $x + 0 = x = 0 + x$ For every real number, x , x is less than $x + 1$



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13. If $\frac{x}{y}$ is the additive inverse of $\frac{c}{d}$, then $\frac{x}{y} - \frac{c}{d} = 0$. True or false.



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14. The reciprocal of a non-zero rational number $\frac{q}{p}$ is the rational number $\frac{q}{p}$. True or false.



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15. If $x + y = 0$, then $-y$ is known as the negative of x , where x and y are rational numbers. True or false.

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16. The negative of the negative of any rational number is the number itself. True or false.

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17. The negative of 0 does not exist.

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18. The negative of 1 is 1 itself.

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19. For all rational numbers x and y , $x - y = y - x$.

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20. For all rational numbers x and y , $x \times y = y \times x$.

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21. For every rational number x , $x \times 0 = x$.

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22. For every rational numbers x , y and z ,

$$x + (y \times z) = (x + y) \times (x + z).$$

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23. For all rational numbers a , b and c , $a(b + c) = ab + bc$.

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24. 1 is the only number which is its own reciprocal.

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25. -1 is not the reciprocal of any rational number.

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26. For any rational number x , $x + (-1) = -x$.

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27. For rational numbers x and y , if $x < y$ then $x - y$ is a positive rational number.



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28. If x and y are negative rational numbers, then so is $x + y$.



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29. Between any two rational numbers there are exactly ten rational numbers.



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30. State True or False

Rational numbers are closed under addition and multiplication but not under subtraction.



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31. state true or false

Subtraction of rational number is commutative.



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32. $-\frac{3}{4}$ is smaller than -2 .



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33. 0 is a rational number.



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34. All positive rational numbers lie between 0 and 1000.



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35. The population of India in 2004 - 05 is a rational number.

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36. There are countless rational numbers between $\frac{5}{6}$ and $\frac{8}{9}$.

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37. The reciprocal of x^{-1} is $\frac{1}{x}$.

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38. The rational number $\frac{57}{23}$ lies to the left of zero on the number line.

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39. The rational number $\frac{7}{-4}$ lies to the right of zero on the number line.

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40. The rational number $\frac{-8}{-3}$ lies neither to the right nor to the left of zero on the number line.

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41. The rational numbers $\frac{1}{2}$ and -1 are on the opposite sides of zero on the number line.

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42. Every fraction is a rational number.

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43. Every integer is a rational number.

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44. The rational numbers can be represented on the number line.

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45. The negative of a negative rational number is a positive rational number

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46. State true or false

If x and y are two rational numbers such that $x > y$, then $x - y$ is always a positive rational number.

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47. 0 is the smallest rational number.

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48. Every whole number is an integer.

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49. Which of the following statements are true and which are false?

- (i) Every whole number is a rational number.
- (ii) Every integer is a rational number.
- (iii) 0 is a whole number but it is not a rational number.

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50. Which of the following statements are true and which are false?

- (i) Every whole number is a rational number.

(ii) Every integer is a rational number.

(iii) 0 is a whole number but it is not a rational number.

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51. The rational numbers $\frac{1}{2}$ and $-\frac{5}{2}$ are on the opposite sides of 0 on the number line.

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52. Rational numbers can be added (or multiplied) in any order

$$\frac{-4}{5} \times \frac{-6}{5} = \frac{-6}{5} \times \frac{-4}{5}$$

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Exercise

1. Solve the following: Select the rational numbers from the list which are also the integers.

$$\frac{9}{4}, \frac{8}{4}, \frac{7}{4}, \frac{6}{4}, \frac{9}{3}, \frac{8}{3}, \frac{7}{3}, \frac{6}{3}, \frac{5}{2}, \frac{4}{2}, \frac{3}{1}, \frac{3}{2}, \frac{1}{1}, \frac{0}{1}, \frac{-1}{1}, \frac{-2}{1}, \frac{-3}{2}, \frac{-4}{2}, \frac{-5}{2}$$

,

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2. Select those rational numbers which can be written as a rational number with denominator 4: $\frac{7}{8}, \frac{64}{16}, \frac{36}{-12}, \frac{-16}{17}, \frac{5}{-4}, \frac{140}{28}$

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3. Using suitable rearrangement and find the sum:

$$\frac{4}{7} + \left(\frac{-4}{9}\right) + \frac{3}{7} + \left(\frac{-13}{9}\right)$$

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4. Using suitable rearrangement and find the sum:

$$-5 + \frac{7}{10} + \frac{3}{7} + (-3) + \frac{5}{14} + \frac{-4}{5}$$

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5. Verify $-(-x) = x$ for $x = \frac{3}{5}$

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6. Verify $-(-x) = x$ for $x = \frac{-7}{9}$

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7. Verify $-(-x) = x$ for $x = \frac{13}{-15}$

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8. Give one example each to show that the rational numbers are closed under addition, subtraction and multiplication. Are rational numbers closed under division? Give two examples in support of your answer.

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9. Verify the property $x + y = y + x$ of rational numbers by taking

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

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10. Verify the property $x + y = y + x$ of rational numbers by taking

$$x = \frac{-2}{3}, y = \frac{-5}{6}$$

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11. Verify the property $x + y = y + x$ of rational numbers by taking

$$x = \frac{-3}{7}, y = \frac{20}{21}$$

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12. Verify the property $x + y = y + x$ of rational numbers by taking

$$x = \frac{-2}{5}, y = \frac{-9}{10}$$

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13. Simplify each of the following using suitable property.

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

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14. Simplify each of the following by using suitable property. Also name the property.

$$\left[\frac{1}{5} \times \frac{2}{15} \right] - \left[\frac{1}{5} \times \frac{2}{5} \right]$$



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15. Simplify each of the following by using suitable property. Also name the property.

$$\frac{-3}{5} \times \left\{ \frac{3}{7} + \left(\frac{-5}{6} \right) \right\}$$



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16. Tell which property allows you to compute

$$\frac{1}{5} \times \left[\frac{5}{6} \times \frac{7}{9} \right] \text{ as } \left[\frac{1}{5} \times \frac{5}{6} \right] \times \frac{7}{9}$$



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17. Verify the property $x \times y = y \times x$ of rational numbers by using

$$x = 7 \text{ and } y = \frac{1}{2}$$

and What is the name of this property?



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18. Verify the property $x \times y = y \times x$ of rational numbers by using

$$x = \frac{2}{3} \text{ and } y = \frac{9}{4}$$

and What is the name of this property?



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19. Verify the property $x \times y = y \times x$ of rational numbers by using

$$x = \frac{-5}{7} \text{ and } y = \frac{14}{15}$$

and What is the name of this property?



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20. Verify the property $x \times y = y \times x$ of rational numbers by using

$$x = \frac{-3}{8} \text{ and } y = \frac{-4}{9}$$

and What is the name of this property?



21. Verify the property $x \times (y \times z) = (x \times y) \times z$ of rational numbers by using

$$x = 1, y = \frac{-1}{2} \text{ and } z = \frac{1}{4}.$$

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22. Verify the property $x \times (y \times z) = (x \times y) \times z$ of rational numbers by using

$$x = \frac{2}{3}, y = \frac{-3}{7} \text{ and } z = \frac{1}{2}.$$

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23. Verify the property $x \times (y \times z) = (x \times y) \times z$ of rational numbers by using

$$x = \frac{-2}{7}, y = \frac{-5}{6} \text{ and } z = \frac{1}{4}.$$

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24. Verify the property $x \times (y \times z) = (x \times y) \times z$ of rational numbers by using

$$x = 0, y = \frac{1}{2}.$$

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25. Verify the property $x \times (y + z) = x \times y + x \times z$ of rational numbers by taking.

$$x = \frac{-1}{2}, y = \frac{3}{4}, z = \frac{1}{4}$$

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26. Verify the property $x \times (y + z) = x \times y + x \times z$ of rational numbers by taking.

$$x = \frac{-1}{2}, y = \frac{2}{3}, z = \frac{3}{4}$$

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27. Verify the property $x \times (y + z) = x \times y + x \times z$ of rational numbers by taking.

$$x = \frac{-2}{3}, y = \frac{-4}{6}, z = \frac{-7}{9}$$



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28. Verify the property $x \times (y + z) = x \times y + x \times z$ of rational numbers by taking.

$$x = \frac{-1}{5}, y = \frac{2}{15}, z = \frac{-3}{10}$$



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29. Use the distributivity of multiplication of rational numbers over their addition to simplify:

(i) $\frac{3}{5} \times \left(\frac{35}{24} + \frac{10}{1} \right)$

(ii) $\frac{-5}{4} \times \left(\frac{8}{5} + \frac{16}{5} \right)$



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30. Use the distributivity of multiplication of rational numbers over their

addition to simplify: $\frac{3}{5}x \left(\frac{35}{24} + \frac{10}{1} \right)$ (ii) $\frac{-5}{4}x \left(\frac{8}{5} + \frac{16}{5} \right)$

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31. Use the distributivity of multiplication of rational numbers over their

addition to simplify: $\frac{2}{7}x \left(\frac{7}{16} - \frac{21}{4} \right)$ (ii) $\frac{3}{4}x \left(\frac{8}{9} - 40 \right)$

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32. Use the distributivity of multiplication of rational numbers over their

addition to simplify:

(i) $\frac{2}{7} \times \left(\frac{7}{16} - \frac{21}{4} \right)$

(ii) $\frac{3}{4} \times \left(\frac{8}{9} - 40 \right)$

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33. Simplify

$$\frac{32}{5} + \frac{23}{11} \times \frac{22}{15}$$



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34. Simplify

$$\frac{3}{7} \times \frac{28}{15} \div \frac{14}{5}$$



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35. Simplify

$$\frac{3}{7} + \frac{-2}{21} \times \frac{-5}{6}$$



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36. Simplify

$$\frac{7}{8} + \frac{1}{16} - \frac{1}{12}$$



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37. Identify the rational number that does not belong with the other three. Explain your reasoning

$$\frac{5}{11}, \frac{1}{2}, \frac{4}{9}, \frac{7}{3}$$

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38. The cost of $\frac{19}{4}$ metres of wire is Rs. $\frac{171}{2}$. Find the cost of one metre of the wire.

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39. A train travels $\frac{1445}{2}$ km in $\frac{17}{2}$ hours. Find the speed of the train in km/h.

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40. If 16 shirts of equal size can be made out of 24m of cloth, how much cloth is needed for making one shirt?

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41. $\frac{7}{11}$ of all the money in Hamid's bank account is Rs. 77,000. How much money does Hamid have in his bank account?

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42. A $117\frac{1}{3}$ m long rope is cut into equal pieces measuring $7\frac{1}{3}$ m each. How many such small pieces are these?

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43. $\frac{1}{6}$ of the class students are above average, $\frac{1}{4}$ are average and rest are below average. If there are 48 students in all, how many students are

below average in the class?



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44. $\frac{2}{5}$ of total number of students of a school come by car while $\frac{1}{4}$ of students come by bus to school. All the other students walk to school of which $\frac{1}{3}$ walk on their own and the rest are escorted by their parents. If 224 students come to school walking on their own, how many students study in that school?



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45. Huma, Hubna and Seema received a total of Rs. 2,016 as monthly allowance from their mother such that Seema gets $\frac{1}{2}$ of what Huma gets and Hubna gets $1\frac{2}{3}$ times Seema's share. How much money do the three sisters get individually?



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46. A mother and her two daughters got a room constructed for Rs. 62,000. The elder daughter contributes $\frac{3}{8}$ of her mother's contribution while the younger daughter contributes $\frac{1}{2}$ of her mother's share. How much do the three contribute individually?

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47. Tell which property allows you to compare

$$\frac{2}{3} \times \left[\frac{3}{4} \times \frac{5}{7} \right] \text{ and } \left[\frac{2}{3} \times \frac{5}{7} \right] \times \frac{3}{4}$$

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48. Name the property used in the following.

$$\frac{-7}{11} \times \frac{-3}{5} = \frac{-3}{5} \times \frac{-7}{11}$$

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49. Name the property used in the following.

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



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50. Name the property used in the following.

$$\frac{1}{3} + \left(\frac{4}{9} + \left(\frac{-4}{3} \right) \right) = \left(\frac{1}{3} + \frac{4}{9} \right) + \left(\frac{-4}{3} \right)$$



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51. Name the property used in the following.

$$\frac{-2}{7} + 0 = 0 + \frac{-2}{7} = -\frac{2}{7}$$



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52. Name the property used in the following.

$$\frac{3}{8} \times 1 = 1 \times \frac{3}{8} = \frac{3}{8}$$



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53. Find the multiplicative inverse of

(i) $-\frac{1}{8}$ (ii) $3\frac{1}{3}$



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54. Arrange the numbers $\frac{1}{4}$, $\frac{13}{16}$, $\frac{5}{8}$ in the descending order.



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55. The product of two rational numbers is $\frac{-14}{27}$. If one of the numbers be $\frac{7}{9}$, find the other.



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56. By what number should we multiply $\frac{-15}{28}$ so that the product may be $\frac{-5}{7}$?

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57. By what number should we multiply $\frac{-8}{13}$ so that the product may be 24?

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58. The product of two rational numbers is -7. If one of the number is -5, find the other?

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59. Can you find a rational number whose multiplicative inverse is -1?

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60. Find five rational numbers between 0 and 1.

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61. Find two rational numbers whose absolute value is $\frac{1}{5}$.

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62. From a rope 40 metres long, pieces of equal size are cut. If the length of one piece is $\frac{10}{3}$ metre, find the number of such pieces.

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63. $5\frac{1}{2}$ metres long rope is cut into 12 equal pieces. What is the length of each piece?

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64. Write the following rational numbers in the descending order.

$$\frac{8}{7}, \frac{-9}{8}, \frac{-3}{2}, 0, \frac{2}{5}$$



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65. Find $0 \div \frac{2}{3}$



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66. Find $\frac{1}{3} \times \frac{-5}{7} \times \frac{-21}{10}$



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67. On a winter day the temperature at a place in Himachal Pradesh was $-16^{\circ}C$. Convert it in degree Fahrenheit ($^{\circ}F$) by using the formula.

$$\frac{C}{5} = \frac{F - 32}{9}$$



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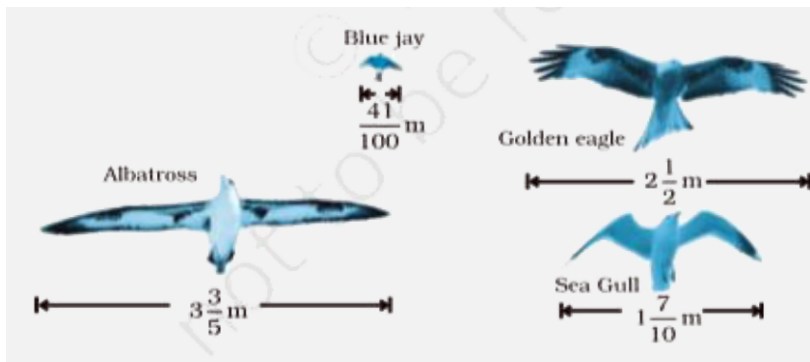
68. Find the sum of additive inverse and multiplicative inverse of 7.

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69. Find the product of additive inverse and multiplicative inverse of $-\frac{1}{3}$.

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70. The diagram shows the wingspans of different species of birds. Use the diagram to answer the question given below:



(a) How much longer is the wingspan of an Albatross than the wingspan

of a Sea gull?

(b) How much longer is the wingspan of a Golden eagle than the wingspan of a Blue jay?

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71. Shalini has to cut out circles of diameter $1\frac{1}{4}$ cm from an aluminium strip of dimensions $8\frac{3}{4}$ cm by $1\frac{1}{4}$ cm. How many full circles can Shalini cut? Also calculate the wastage of the aluminium strip.



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72. One fruit salad recipe requires $\frac{1}{2}$ cup of sugar. Another recipe for the same fruit salad requires 2 tablespoons of sugar. If 1 tablespoon is equivalent to $\frac{1}{16}$ cup, how much more sugar does the first recipe require?

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73. Four friends had a competition to see how far could they hop on one foot. The table given shows the distance covered by each.

Name	Distance covered (km)
Seema	$\frac{1}{25}$
Nancy	$\frac{1}{32}$
Megha	$\frac{1}{40}$
Soni	$\frac{1}{20}$

- (a) How farther did Soni hop than Nancy?
- (b) What is the total distance covered by Seema and Megha?
- (c) Who walked farther, Nancy or Megha?



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74. The table given below shows the distances, in kilometres, between four villages of a state. To find the distance between two villages, locate the square where the row for one village and the column for the other

village intersect.



(a) Compare the distance between Himgaon and Rawalpur to Sonapur and Ramgarh?

(b) If you drove from Himgaon to Sonapur and then from Sonapur to Rawalpur, how far would you drive?

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75. The table shows the portion of some common materials that are recycled.

Material	Recycled
Paper	$\frac{5}{11}$
Aluminum cans	$\frac{5}{8}$
Glass	$\frac{2}{5}$
Scrap	$\frac{3}{4}$

(a) Is the rational number expressing the amount of paper recycled more

than $\frac{1}{2}$ or less than $\frac{1}{2}$?

(b) Which items have a recycled amount less than $\frac{1}{2}$?

(c) Is the quantity of aluminium cans recycled more (or less) than half of the quantity of aluminium cans?

(d) Arrange the rate of recycling the materials from the greatest to the smallest.

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76. The overall width in cm of several wide-screen televisions are 97.28 cm, $98\frac{4}{9}$ cm, $98\frac{1}{25}$ cm and 97.94 cm. Express these numbers as rational numbers in the form $\frac{p}{q}$ and arrange the widths in ascending order.

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77. Roller Coaster at an amusement park is $\frac{2}{3}$ m high. If a new roller coaster is built that is $\frac{3}{5}$ times the height of the existing coaster, what will be the height of the new roller coaster?

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78. Here is a table which gives the information about the total rainfall for several months compared to the average monthly rains of a town. Write each decimal in the form of rational number $\frac{p}{q}$.

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79. The average life expectancies of males for several states are shown in the table. Express each decimal in the form $\frac{p}{q}$ and arrange the states from the least to the greatest male life expectancy. State-wise data are included below, more indicators can be found in the "FACTFILE" section on the homepage for each state.

State	Male	$\frac{p}{q}$ form	Lowest terms
Andhra Pradesh	61.6		
Assam	57.1		
Bihar	60.7		
Gujarat	61.9		
Haryana	64.1		
Himachal Pradesh	65.1		
Karnataka	62.4		
Kerala	70.6		
Madhya Pradesh	56.5		
Maharashtra	64.5		
Orissa	57.6		
Punjab	66.9		
Rajasthan	59.8		
Tamil Nadu	63.7		
Uttar Pradesh	58.9		
West Bengal	62.8		
India	60.8		

Source: Registrar General of India (2003) SRS Based Abridged Life Tables.

SRS Analytical Studies, Report No. 3 of 2003, New Delhi: Registrar General of India. The data are for the 1995-99 period, states subsequently divided are therefore included in their pre-partition states (Chhatisgarh in MP, Uttaranchal in UP and Jharkhand in Bihar)

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80. A skirt that is $35\frac{7}{8}$ cm long has a hem of $3\frac{1}{8}$ cm. How long will the skirt be if the hem is let down?

81. Manavi and Kuber each receives an equal allowance. The table shows the fraction of their allowance each deposits into his/her saving account and the fraction each spends at the mall. If allowance of each is Rs. 1260 find the amount left with each.

Where money goes	Fraction of allowance	
	Manavi	Kuber
Saving Account	$\frac{1}{2}$	$\frac{1}{3}$
Spend at mall	$\frac{1}{4}$	$\frac{3}{5}$
Left over	?	?

82. Read the problem given below, and then answer the questions that follow

Five friends are standing in line for the opening of a show. They are in line according to their arrival. Shreya arrived 3 minutes after Sachin. Roy took

his place in line at 9:01 P.M. He was 1 minute behind Reena and 7 minutes ahead of Shreya. The first person arrived at 9:00 P.M. Babu showed up 6 minutes after the first person. List the time of each person's arrival.

Whose arrival information helped you determine each person's arrival time?

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83. Read the problem given below, and then answer the questions that follow

Five friends are standing in line for the opening of a show. They are in line according to their arrival. Shreya arrived 3 minutes after Sachin. Roy took his place in line at 9:01 P.M. He was 1 minute behind Reena and 7 minutes ahead of Shreya. The first person arrived at 9:00 P.M. Babu showed up 6 minutes after the first person. List the time of each person's arrival.

Can you determine the order without the time?

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84. Read the problem given below, and then answer the questions that follow

Five friends are standing in line for the opening of a show. They are in line according to their arrival. Shreya arrived 3 minutes after Sachin. Roy took his place in line at 9:01 P.M. He was 1 minute behind Reena and 7 minutes ahead of Shreya. The first person arrived at 9:00 P.M. Babu showed up 6 minutes after the first person. List the time of each person's arrival.

List the friends' order of arrival from the earliest to the last.



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Games And Puzzles

1. Given below is a magic square. Place the numbers $\frac{70}{95}$, $\frac{-21}{-133}$, $\frac{25}{95}$, $\frac{24}{38}$ in the appropriate squares so that sum in each row, column and diagonal is equal.

$\frac{32}{38}$	$\frac{18}{38}$	$\frac{4}{38}$	$\frac{-14}{-38}$
$\frac{-18}{-57}$?	?	$\frac{104}{152}$
$\frac{22}{38}$?	?	$\frac{-20}{-95}$
$\frac{1}{19}$	$\frac{-16}{-38}$	$\frac{45}{57}$	$\frac{60}{114}$

Hint: (Rewrite each rational number in its lowest term.)



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Think And Discuss

1. Some other easier ways to find the answer.

Is the product greater than both the rational numb or less than both the rational numbers?



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