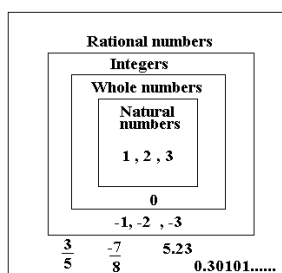




BULLET POINTS

CHAPTER 01: RATIONAL NUMBERS (CLASS: VIII)

- A number in the form $\frac{p}{q}$ where p and q are integers and $q \neq 0$ is called a rational number.
- **Lowest form of a rational number** – A rational number $\frac{p}{q}$ is said to be in the lowest form or simplest form if p and q have no common factor other than 1 and $q \neq 0$.



- Addition, subtraction, multiplication and division of rational numbers are done in the same way as we do for fractions.
- **Properties of rational numbers:**
 - i) **Closure Property:** Rational numbers are closed under the operations of addition, subtraction and multiplication. For any two rational numbers a and b ,
 $a + b$ is a rational number
 $a - b$ is a rational number
 $a \times b$ is a rational number
 - ii) **Commutative Property (Commutativity):** Addition and multiplication are commutative for rational numbers. For any two rational numbers a and b ,
 $a + b = b + a$ and $a \times b = b \times a$
 - iii) **Associative Property (Associativity):** Addition and multiplication are associative for rational numbers. For any three rational numbers a , b and c ,
 $a + (b + c) = (a + b) + c$
 $a \times (b \times c) = (a \times b) \times c$
 - iv) **Distributivity of rational numbers:** For all the rational numbers a , b and c ,
 $a \times (b + c) = a \times b + a \times c$
 $a \times (b - c) = a \times b - a \times c$
 - v) **Additive Identity:** Zero is called the identity for addition of rational numbers. If a is any rational number, $a + 0 = 0 + a = a$
 - vi) **Additive Inverse or negative of a rational number:** For any rational number $\frac{a}{b}$, we have
 $\frac{a}{b} + \left(-\frac{a}{b}\right) = \left(-\frac{a}{b}\right) + \frac{a}{b}$. We say that $-\frac{a}{b}$ is the additive inverse of $\frac{a}{b}$ and $\frac{a}{b}$ is the additive inverse of $\left(-\frac{a}{b}\right)$
 - vii) **Multiplicative Identity:** The rational number 1 is the multiplicative identity for rational numbers. If a is any rational number then, $a \times 1 = 1 \times a = a$
 - viii) **Reciprocal or Multiplicative inverse:** If the product of any two rational numbers is 1, then one number is called the reciprocal of the other rational number.

Thus, a rational number $\frac{a}{b}$ is called the reciprocal of another rational number $\frac{c}{d}$ if

$$\frac{a}{b} \times \frac{c}{d} = 1$$

- Rational numbers can be represented on a number line.
- Between any two given rational numbers there are infinitely many rational numbers. The idea of **mean** helps us to find rational numbers between two given rational numbers.



SUBJECT	MATHEMATICS
CLASS	VIII
CHAPTER	RATIONAL NUMBERS
E-book/video link	http://ncert.nic.in/textbook/textbook.htm https://www.learnbse.in/ncert-solutions-for-class-8-maths-rational-numbers/ https://www.youtube.com/watch?v=Slw5SCy9P14 https://www.youtube.com/watch?v=9_Ak4tgnAt4 https://www.youtube.com/watch?v=YUa1EzuDZwY
Day 01	<p>Students to read the following topic thoroughly from text book and first solve the example sums and try these.</p> <p>Page no. 1-6</p> <ul style="list-style-type: none"> ➤ Introduction <ul style="list-style-type: none"> • Define natural numbers, whole numbers, integers and rational numbers with examples. • Properties of Rational numbers : Closure and commutativity of whole numbers , Integers and Rational numbers ➤ Try these (pg. no. 4 and 6) ➤ Do the following: i) Is $\frac{3}{7} - \left(\frac{-8}{5}\right)$ a rational number? ii) Is $\frac{-5}{4} \div \frac{3}{7} = \frac{3}{7} \div \left(\frac{-5}{4}\right)$
Day 02	<p>Page no. 7-12</p> <ul style="list-style-type: none"> ➤ Continued.. (properties of rational numbers) <ul style="list-style-type: none"> • Associativity : Whole numbers, Integers and Rational numbers • Role of zero, role of 1 and negative of a number ➤ Try these (pg. no. 9) ➤ Do the sums: i) Is $\frac{-2}{3} - \left[\frac{-4}{5} - \frac{1}{2}\right] = \left[\frac{-2}{3} - \left(\frac{-4}{5}\right) - \frac{1}{2}\right]$ ii) Verify $x \div (y \div z) \neq (x \div y) \div z$ for $x = \frac{1}{2}, y = \frac{-1}{3}, z = \frac{2}{5}$ ➤ Example sums : 1, 2
Day 03	<p>Page no.12-14</p> <ul style="list-style-type: none"> ➤ Continued.. (properties of rational numbers) <ul style="list-style-type: none"> • Reciprocal • Distributivity of multiplication over addition for rational numbers • Verify the property $a \times (b + c) = a \times b + a \times c$ for $a = \frac{-3}{4}, b = \frac{2}{3}$ and $c = \frac{-5}{6}$ ➤ Try these (Pg. no. 13) Q.(i, ii) ➤ Example sums: Q. 3, 4, 5
Day 04	<p>Page no. 14</p> <p>Solve the Exercise sums:</p> <ul style="list-style-type: none"> ➤ Exercise 1.1 : Q.1(i, ii) , Q.2(i – v), Q.3(i,ii), Q.4(i- vi) , Q.5(i- iii)
Day 05	<p>Page no. 14</p> <p>Solve the Exercise sums (continued)</p> <ul style="list-style-type: none"> ➤ Exercise 1.1 : Q.6, 7, 8, 9, 10,11
Day 06	<p>Page no. 15-17 & 20</p> <ul style="list-style-type: none"> ➤ Representation of Rational numbers on the number line

	<p>➤ Try these (Pg. No.17) : Q.(i, ii)</p> <p>➤ Exercise 1.2 : Q.1(i,ii) , Q.2</p>
Day 07	<p>Page no. 17-20</p> <p>➤ Rational Numbers between two rational numbers</p> <ul style="list-style-type: none"> • Activity: Take a rectangular strip of paper and mark 0 and 1 at the shorter side. Fold it into two halves and the crease formed at the middle is the position of $\frac{1}{2}$. Again fold it and we will get four gapes and three rational numbers $\frac{1}{4}, \frac{2}{4} = \frac{1}{2}$ and $\frac{3}{4}$ and thus folding equally this way we will be getting more rational numbers. Thus there are infinite rational numbers between any two consecutive rational numbers. <p>➤ Example sums : Q.6, 7, 8, 9</p> <p>➤ Exercise 1.2 : Q.3, 4, 5 (i-iii), 6, 7</p>

PRACTICE PAPER

1. Choose the correct options

- i. Multiplicative inverse of $\frac{0}{1}$ is _____.
 - a) 0
 - b) -1
 - c) 1
 - d) Not defined
- ii. A rational number between x and y is _____.
 - a) $\frac{x-y}{2}$
 - b) $\frac{x+y}{2}$
 - c) $\frac{x \times y}{2}$
 - d) $\frac{x \div y}{2}$
- iii. The multiplicative inverse of $-1\frac{1}{7}$ is _____.
 - a) $\frac{7}{8}$
 - b) $\frac{-8}{7}$
 - c) $\frac{8}{7}$
 - d) $\frac{7}{-8}$
- iv. 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
- v. 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

2. Fill in the blanks

- i. The negative of a negative rational number is always a _____ rational number.
 - ii. The two rational numbers lying between -2 and -5 with denominator as 1 are _____ and _____.
 - iii. The numbers _____ and _____ are their own reciprocal.
 - iv. If $x = \frac{1}{3}$ and $y = \frac{6}{7}$, then $xy - \frac{y}{x} =$ _____
 - v. The reciprocal of $\frac{2}{5} \times \frac{-4}{9}$ is _____
3. Using suitable rearrangement, find the sum: $-5 + \frac{7}{10} + \frac{3}{7} + (-3) + \frac{5}{14} + \frac{-4}{5}$
4. Simplify using suitable property. Also name the property.
- a) $\left[\frac{1}{5} \times \frac{2}{15}\right] \times \left[\frac{1}{5} \times \frac{2}{5}\right]$
 - b) $\frac{-3}{5} \times \left\{\frac{3}{7} + \left(\frac{-5}{6}\right)\right\}$
5. Simplify: a) $\frac{2}{7} + \left[\frac{-2}{21} \times \frac{-5}{6}\right]$ b) $\frac{3}{7} \times \frac{28}{15} \div \frac{14}{5}$

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

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)

7. Name the property of multiplication of rational numbers for the following statements:

- i) $\frac{-17}{5} \times 9 = 9 \times \frac{-17}{5}$
- ii) $\frac{-5}{9} \times \left(\frac{4}{15} \times \frac{-9}{8}\right) = \left(\frac{-5}{9} \times \frac{4}{15}\right) \times \frac{-9}{8}$
- iii) $\frac{-2}{13} + 0 = 0 + \frac{-2}{13} = \frac{-2}{13}$
- iv) $\frac{-3}{2} \times \frac{5}{4} + \frac{-3}{2} \times \frac{-7}{6} = \frac{-3}{2} \times \left(\frac{5}{4} + \frac{-7}{6}\right)$
- v) $\frac{4}{5} \times 1 = 1 \times \frac{4}{5} = \frac{4}{5}$

7. By what number should we multiply $\frac{-15}{20}$ so that the product may be $\frac{-5}{7}$?

8. Write the rational numbers in the descending order: $\frac{7}{8}, \frac{-9}{8}, \frac{-3}{2}, 0, \frac{2}{5}$

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

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

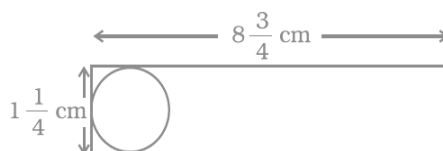
11. From a rope 40 metres long, pieces of equal size are cut. If the length of one piece is $\frac{10}{3}$ metre, find the number of such pieces.

12. 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?

13. The cost of $\frac{10}{4}$ metres of wire is Rs. $\frac{171}{2}$. Find the cost of one metre of the wire.

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

15. 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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