

NCERT SOLUTIONS

CLASS-VIII MATHS

CHAPTER-1 RATIONAL NUMBERS

Exercise – 1.1

1. Using appropriate properties find the value of $-\frac{2}{3} \times \frac{3}{5} + \frac{5}{2} - \frac{3}{5} \times \frac{1}{6}$

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

$$= -\frac{3}{5} \left(\frac{2}{3} + \frac{1}{6} \right) + \frac{5}{2}$$
$$= -\frac{3}{5} \left(\frac{4+1}{6} \right) + \frac{5}{2}$$
$$= -\frac{3}{5} \left(\frac{5}{6} \right) + \frac{5}{2}$$
$$= \frac{-15}{30} + \frac{5}{2}$$
$$= \frac{-1}{2} + \frac{5}{2}$$

$$= 2$$

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

2. Using appropriate properties find the value of $\frac{2}{5} \times \frac{-3}{7} - \frac{1}{6} \times \frac{3}{2} + \frac{1}{14} \times \frac{2}{5}$

Sol. $\frac{2}{5} \times \frac{-3}{7} - \frac{1}{6} \times \frac{3}{2} + \frac{1}{14} \times \frac{2}{5}$

$$= \frac{-2}{5} \times \frac{3}{7} - \frac{1}{2} \times \frac{1}{2} + \frac{1}{7} \times \frac{1}{5}$$
$$= \frac{-6}{35} - \frac{1}{4} + \frac{1}{35}$$
$$= \frac{-5}{35} - \frac{1}{4}$$
$$= \frac{-1}{7} - \frac{1}{4}$$
$$= \frac{-11}{28}$$
$$= \frac{2}{5} \times \frac{-3}{7} - \frac{1}{6} \times \frac{3}{2} + \frac{1}{14} \times \frac{2}{5}$$
$$= \frac{-11}{28}$$

3. Solving the additive inverse of $\frac{2}{8}$

Sol. Additive inverse of $\frac{2}{8}$ is $-\frac{2}{8}$

4. Solving the additive inverse of $-\frac{5}{9}$

Sol. Additive inverse of $-\frac{5}{9}$ is $\frac{5}{9}$

5. Solving the additive inverse of -6

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

Additive inverse of $\frac{6}{5}$ is $\frac{-6}{5}$

Additive inverse of $\frac{-6}{-5}$ is $\frac{-6}{5}$

6. Solving the additive inverse of $\frac{2}{-9}$

Sol. Additive inverse of $\frac{2}{-9}$ is $\frac{2}{9}$

7. Verify that $-(-x) = x$ for $x = \frac{11}{15}$

Sol. $x = \frac{11}{15}$

$$-x = \frac{-11}{15} \quad -(-x) = -\left(\frac{-11}{15}\right)$$

$$= \frac{11}{15} = x$$

therefore $-(-x) = x$

8. Verify that $-(-x) = x$ for $x = \frac{-13}{17}$

Sol. $x = \frac{-13}{17}$

$$-x = \left(-\frac{-13}{17}\right) = \frac{13}{17} \quad -(-x) = -\left(\frac{13}{17}\right)$$

$$= \frac{-13}{17} = x$$

therefore $-(-x) = x$

9. Solve that multiplicative inverse of -13

Sol. Given multiplicative inverse -13 is $\frac{-1}{13}$

10. Solve that multiplicative inverse of $\frac{-13}{19}$

Sol. Given multiplicative inverse $\frac{-13}{19}$ is $\frac{-19}{13}$

11. Solve that multiplicative inverse of $\frac{-5}{8} \times \frac{-3}{7}$

Sol. Given multiplicative inverse $\frac{-5}{8} \times \frac{-3}{7}$ is $\frac{8}{5} \times \frac{7}{3}$ or $\frac{-8}{5} \times \frac{-7}{3}$

12. What is the multiplicative inverse of -1.

Sol. The multiplicative inverse of -1 is -1.

13. Name the property under multiplicative used in each of the following.

(i) $\frac{-4}{5} \times 1 = 1 \times \frac{-4}{5} = \frac{-4}{5}$

(ii) $\frac{-13}{17} \times \frac{-2}{7} = \frac{-2}{7} \times \frac{-13}{17}$

(iii) $\frac{-19}{29} \times \frac{29}{-19} = 1$

Sol. (i) ROLE OF 1

(ii) COMMUTATIVITY

(iii) MULTIPLICATIVE INVERSE

14. Multiply $\frac{6}{13}$ by the reciprocal of $\frac{-7}{6}$

Sol. Reciprocal of $\frac{-7}{6}$ is $\frac{6}{-7}$

therefore $\frac{6}{13} \times \frac{6}{-7}$

$= \frac{-36}{91}$

15. what property allows you to compute $\frac{1}{3} \times (6 \times \frac{4}{3}) (\frac{1}{3} \times 6) \times \frac{4}{5}$

Sol. Associativity

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

Sol.

$-1\frac{1}{8} = \frac{-9}{8}$

$= \frac{8}{9} \times \frac{-9}{8}$

$= -1 \neq 1$

therefore $\frac{8}{9}$ is not the multiplicative inverse of Misplaced &

17. Is 0.3 the multiplicative inverse of $3\frac{1}{3}$? why or why not.

Sol. $3\frac{1}{3} = \frac{10}{3} = 3.3$

Misplaced &

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Exercise 1.2:

Question 1:

Solve the following using appropriate properties:

$$1. \text{ ii) } \frac{2}{5} * \frac{-3}{7} - \frac{1}{6} * \frac{3}{2} + \frac{1}{14} * \frac{2}{5}$$

Answers:

1. ii) Use commutativity of rational numbers

$$\frac{2}{5} * \frac{-3}{7} - \frac{1}{6} * \frac{3}{2} + \frac{1}{14} * \frac{2}{5}$$

Using distributive property

$$\frac{2}{5} * \left[\frac{-3}{7} + \frac{1}{14} \right] - \frac{1}{4}$$

$$= \frac{2}{5} * \frac{-3*2+1}{14} - \frac{1}{4}$$

$$= \frac{2}{5} * \frac{-5}{14} - \frac{1}{4}$$

$$= \frac{-4-7}{28} = \frac{-11}{28}$$

Question 2:

$$(i) \frac{-5}{-7}$$

$$(ii) \frac{-4}{-7}$$

$$(iii) \frac{2}{-5}$$

$$(iv) \frac{5}{-9}$$

Solution:

$$(i) \frac{-5}{-7}$$

$$\text{additive inverse} = \frac{5}{-7}$$

$$(ii) \frac{-4}{-7} = \frac{4}{7}$$

$$\text{Additive inverse} = \frac{-4}{7}$$

$$(iii) \frac{2}{-5}$$

$$\text{Additive inverse} = \frac{2}{5}$$

$$(iv) \frac{5}{-9}$$

$$\text{Additive inverse} = \frac{5}{9}$$

Question 3:

$$(i) x = \frac{11}{15}$$

$$(ii) x = \frac{-13}{17}$$

Solution:

$$x = \frac{11}{15}$$

The additive inverse of is $x = \frac{-11}{15}$

This equality

$$x = \frac{11}{15} + \frac{-1115}{15} = 0$$

$$= -(-x) = x$$

$$x = \frac{-13}{17}$$

$$\text{The additive inverse of } x = \frac{-13}{17} = x = \frac{13}{17}$$

This equality

$$x = \frac{-13}{17} + \frac{13}{17} = 0$$

$$= -(-x) = x$$

Question 4:

(i) -12

(ii) $\frac{-19}{13}$

(iii) $\frac{1}{3}$

(iv) $\frac{-3}{8} * \frac{-3}{8}$

(v) $-1 * \frac{-3}{5}$

Solutions:

1. The multiplicative inverse of -12 is $\frac{1}{12}$
2. The multiplicative inverse of $\frac{-19}{13}$ is $\frac{-13}{19}$
3. The multiplicative inverse of $\frac{1}{3}$ is $\frac{3}{1} = 3$
4. The multiplicative inverse of $-1 * \frac{-3}{5}$ is $\frac{5}{3}$

Question 5:

Find out the multiplication property that is used in the following sums:

(i) $\frac{-3}{7} * 1 = 1 * \frac{-3}{7} = \frac{-3}{7}$

(ii) $\frac{-14}{17} * \frac{-3}{4} = \frac{-3}{4} * \frac{-14}{17}$

(iii) $\frac{-17}{37} * \frac{37}{-17} = 1$

Solutions:

1. This uses the multiplicative identity property and the multiplicative identity is 1
2. This uses the commutativity property
3. This uses the multiplicative inverse property
- 4.

Question 6:

Find the product of $\frac{7}{15}$ and the reciprocal of $\frac{-4}{17}$

Solution:

Reciprocal of $\frac{-4}{17} = \frac{-17}{4}$

Misplaced &

Question 7:

1. Which rational number does not have a reciprocal
2. Which rational number is equal to its own reciprocal
3. Which rational number is equal to its own negative

Solution:

1. Zero is the rational number that has no reciprocal
2. One and negative one are rational numbers that are equal to their own reciprocal
3. Zero is a rational number that is also equal to its own negative.

Question 8: Answer or complete the following sentences:

1. Does zero have a reciprocal?
2. The two numbers _____ and _____ are their own reciprocals.
3. What is the reciprocal of -6?
4. What is the reciprocal of ?
5. The product of two rational numbers is always a _____.
6. The reciprocal of a positive rational number is _____.

Solutions:

1. No it doesn't
2. 1, -1
3. -1/6
4. X
5. Rational number
6. Positive rational number

Question 9:

Find the multiplicative inverse of the following:

1. -12
2. $\frac{-12}{18}$
3. $\frac{2}{7}$
4. -1
5. $\frac{-3}{8} * \frac{-5}{7}$
6. $-2 * \frac{-2}{7}$

Solutions:

1. $\frac{-1}{12}$
2. $\frac{-12}{18}$
3. $\frac{7}{2}$
4. -1

5. $\frac{30}{15}$
6. $\frac{7}{2}$

Question 10:

Is 0.3 the multiplicative inverse of $3\frac{1}{3}$? Why or why not?

Answer:

Misplaced & $0.3 * 3\frac{1}{3} = 0.3 * \frac{10}{3} = \frac{3}{10} * \frac{10}{3} = 1$

As proved above the product is one.

Therefore, 0.3 is the multiplicative inverse of $3\frac{1}{3}$

