

Exercise 1.1

Page: 14

1. Using appropriate properties find.

(i) $-2/3 \times 3/5 + 5/2 - 3/5 \times 1/6$

Solution:

$$\begin{aligned}
 & -2/3 \times 3/5 + 5/2 - 3/5 \times 1/6 \\
 & = -2/3 \times 3/5 - 3/5 \times 1/6 + 5/2 && \text{(by commutativity)} \\
 & = 3/5 (-2/3 - 1/6) + 5/2 \\
 & = 3/5 ((-4 - 1)/6) + 5/2 \\
 & = 3/5 ((-5)/6) + 5/2 && \text{(by distributivity)} \\
 & = -15/30 + 5/2 \\
 & = -1/2 + 5/2 \\
 & = 4/2 \\
 & = 2
 \end{aligned}$$

(ii) $2/5 \times (-3/7) - 1/6 \times 3/2 + 1/14 \times 2/5$

Solution:

$$\begin{aligned}
 & 2/5 \times (-3/7) - 1/6 \times 3/2 + 1/14 \times 2/5 \\
 & = 2/5 \times (-3/7) + 1/14 \times 2/5 - (1/6 \times 3/2) && \text{(by commutativity)} \\
 & = 2/5 \times (-3/7 + 1/14) - 3/12 \\
 & = 2/5 \times ((-6 + 1)/14) - 3/12 \\
 & = 2/5 \times ((-5)/14) - 1/4 \\
 & = (-10/70) - 1/4 \\
 & = -1/7 - 1/4 \\
 & = (-4 - 7)/28 \\
 & = -11/28
 \end{aligned}$$

2. Write the additive inverse of each of the following**Solution:**

(i) $2/8$

Additive inverse of $2/8$ is $-2/8$

(ii) $-5/9$

Additive inverse of $-5/9$ is $5/9$

(iii) $-6/5 = 6/5$

Additive inverse of $6/5$ is $-6/5$

(iv) $2/-9 = -2/9$

Additive inverse of $-2/9$ is $2/9$

(v) $19/-16 = -19/16$

Additive inverse of $-19/16$ is $19/16$ **3. Verify that: $-(-x) = x$ for.**

(i) $x = 11/15$

(ii) $x = -13/17$

Solution:

(i) $x = 11/15$

We have, $x = 11/15$

The additive inverse of x is $-x$

(as $x + (-x) = 0$)

Then, the additive inverse of $11/15$ is $-11/15$

(as $11/15 + (-11/15) = 0$)

The same equality $11/15 + (-11/15) = 0$, shows that the additive inverse of $-11/15$ is $11/15$.

Or, $-(-11/15) = 11/15$

i.e., $-(-x) = x$

(ii) $-13/17$

We have, $x = -13/17$

The additive inverse of x is $-x$

(as $x + (-x) = 0$)

Then, the additive inverse of $-13/17$ is $13/17$

(as $-13/17 + 13/17 = 0$)

The same equality $-13/17 + 13/17 = 0$, shows that the additive inverse of $13/17$ is $-13/17$.

Or, $-(13/17) = -13/17$,

i.e., $-(-x) = x$

4. Find the multiplicative inverse of the

(i) -13

(ii) $-13/19$

(iii) $1/5$

(iv) $-5/8 \times (-3/7)$

(v) $-1 \times (-2/5)$

(vi) -1

Solution:

(i) -13

Multiplicative inverse of -13 is $-1/13$

(ii) $-13/19$

Multiplicative inverse of $-13/19$ is $-19/13$

(iii) $1/5$

Multiplicative inverse of $1/5$ is 5

(iv) $-5/8 \times (-3/7) = 15/56$

Multiplicative inverse of $15/56$ is $56/15$

(v) $-1 \times (-2/5) = 2/5$

Multiplicative inverse of $2/5$ is $5/2$

(vi) -1

Multiplicative inverse of -1 is -1

5. Name the property under multiplication used in each of the following.

(i) $-4/5 \times 1 = 1 \times (-4/5) = -4/5$

(ii) $-13/17 \times (-2/7) = -2/7 \times (-13/17)$

(iii) $-19/29 \times 29/-19 = 1$

Solution:

(i) $-4/5 \times 1 = 1 \times (-4/5) = -4/5$

Here 1 is the multiplicative identity.

(ii) $-13/17 \times (-2/7) = -2/7 \times (-13/17)$

The property of commutativity is used in the equation

(iii) $-19/29 \times 29/-19 = 1$

Multiplicative inverse is the property used in this equation.

6. Multiply $6/13$ by the reciprocal of $-7/16$

Solution:

Reciprocal of $-7/16 = 16/-7 = -16/7$

According to the question,

$$6/13 \times (\text{Reciprocal of } -7/16)$$

$$6/13 \times (-16/7) = -96/91$$

7. Tell what property allows you to compute $1/3 \times (6 \times 4/3)$ as $(1/3 \times 6) \times 4/3$

Solution:

$$1/3 \times (6 \times 4/3) = (1/3 \times 6) \times 4/3$$

Here, the way in which factors are grouped in a multiplication problem, supposedly, does not change the product. Hence, the Associativity Property is used here.

8. Is $8/9$ the multiplication inverse of $1\frac{1}{8}$? Why or why not?

Solution:

$$1\frac{1}{8} = -7/8$$

[Multiplicative inverse \Rightarrow product should be 1]

According to the question,

$$8/9 \times (-7/8) = -7/9 \neq 1$$

Therefore, $8/9$ is not the multiplicative inverse of $1\frac{1}{8}$.

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

Solution:

$$3\frac{1}{3} = 10/3$$

$$0.3 = 3/10$$

[Multiplicative inverse \Rightarrow product should be 1]

According to the question,

$$3/10 \times 10/3 = 1$$

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

10. Write

(i) The rational number that does not have a reciprocal.

(ii) The rational numbers that are equal to their reciprocals.

(iii) The rational number that is equal to its negative.

Solution:

(i) The rational number that does not have a reciprocal is 0. Reason:

$$0 = 0/1$$

Reciprocal of $0 = 1/0$, which is not defined.

(ii) The rational numbers that are equal to their reciprocals are 1 and -1.

Reason:

$$1 = 1/1$$

Reciprocal of $1 = 1/1 = 1$ Similarly, Reciprocal of $-1 = -1$

NCERT Solution For Class 8 Maths Chapter 1- Rational Numbers

(iii) The rational number that is equal to its negative is 0.

Reason:

Negative of 0 = -0 = 0

11. Fill in the blanks.

(i) Zero has _____ reciprocal.

(ii) The numbers _____ and _____ are their own reciprocals

(iii) The reciprocal of - 5 is _____.

(iv) Reciprocal of $1/x$, where $x \neq 0$ is _____.

(v) The product of two rational numbers is always a _____.

(vi) The reciprocal of a positive rational number is _____.

Solution:

(i) Zero has no reciprocal.

(ii) The numbers -1 and 1 are their own reciprocals

(iii) The reciprocal of - 5 is -1/5.

(iv) Reciprocal of $1/x$, where $x \neq 0$ is x.

(v) The product of two rational numbers is always a rational number.

(vi) The reciprocal of a positive rational number is positive.