NCERT SOLUTIONS OF Rational Numbers Exercise 1

Question 1:
Using appropriate properties find:

(i) $-\frac{2}{3}\times\frac{3}{5}+\frac{5}{2}-\frac{3}{5}\times\frac{1}{6}$

(ii) $\frac{2}{5}\times\left(-\frac{3}{7}\right)-\frac{1}{6}\times\frac{3}{2}+\frac{1}{14}\times\frac{2}{5}$

Answer

(i) Using commutativity property of rational numbers

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

Now using Distributivity property

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

$$=\left(-\frac{3}{5}\right)\times\left(\frac{2\times2+1}{6}\right)+\frac{5}{2}=\left(-\frac{3}{5}\right)\times\left(\frac{5}{6}\right)+\frac{5}{2}$$

$$=\left(-\frac{3}{6}\right)+\frac{5}{2}=\left(\frac{-3+5\times3}{6}\right)=\left(\frac{-3+15}{6}\right)$$

$$=\frac{12}{6}=2$$

(ii) Using commutativity property of rational numbers

$$\frac{2}{5}\times\left(-\frac{3}{7}\right)-\frac{1}{6}\times\frac{3}{2}+\frac{1}{14}\times\frac{2}{5}=\frac{2}{5}\times\left(-\frac{3}{7}\right)+\frac{1}{14}\times\frac{2}{5}-\frac{1}{6}\times\frac{3}{2}$$

Now using Distributivity property

$$= \frac{2}{5} \times \left(-\frac{3}{7} + \frac{1}{14} \right) - \frac{1}{4}$$

$$= \frac{2}{5} \times \left(\frac{-3 \times 2 + 1}{14} \right) - \frac{1}{4}$$

$$= \frac{2}{5} \times \left(\frac{-5}{14} \right) - \frac{1}{4}$$

$$= -\frac{1}{7} - \frac{1}{4}$$

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

Question 2

Write the additive inverse of each of the following:

i) 2/8

ii) -5/9

iii) -6/-5

(iv) 2/-9

(v) 19/-6

Answer:

(i) 2/8

Additive inverse = -2/8

(ii) -5/9

Additive inverse = 5/9

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

Additive inverse = -6/5

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

Additive inverse =2/9

(v) 19/-6= -19/6

Additive inverse =19/6

Question 3

Verify that - (- x) = x for.

(i) x =11/15 (ii) x=-13/17

Answer:

i) x=11/15

Additive inverse

-x=-11/15

As (11/15) + (-11/15) =0

The above also represent that additive inverse of (-11/15) is (11/15) or we can say that

- (-11/15)=11/15

Or x=-(-x)

ii) x=-13/17

Additive inverse

-x=-13/17

As (-13/17) + (13/17) =0

The above also represent that additive inverse of (13/17) is (-13/17)) or we can say that

- (13/17) = -13/17

Or x=-(-x)

Question 4

Find the multiplicative inverse of the following.

(i) -13

(ii) -13/19

(iii) 1/5

(iv) -5/8 X -3/7

(v) -1 X -2/5

(vi) - 1

Answer

i) -13

Multiplicative inverse =-1/13

ii) -13/19

Multiplicative inverse =-19/13

iii) 1/5

Multiplicative inverse =5

iv) -5/8 X -3/7 =15/56

Multiplicative inverse =56/15

v) -1 X -2/5 =2/5

Multiplicative inverse =5/2

vi) -1

Multiplicative inverse =-1

Question 5 :

Name the property under multiplication 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) $\frac{-19}{29}\times\frac{29}{-19} = 1$

Answer:

i) 1 is the multiplicative identity

ii) Commutatively

iii) Multiplicative inverse

Question 6:
Multiply 6/13 by the reciprocal of -7/16

Answer

Reciprocal of -7/16= -16/7

So (6/13) X (-16/7) =-96/91

Question 7
Tell what property allows you to compute

$\frac{1}{3}\times\left(6\times\frac{4}{3}\right)$ as $\left(\frac{1}{3}\times 6\right)\times\frac{4}{3}$

Answer:

Associativity

Question 8
Is 8/9 the multiplicative inverse of

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

Why or why not?

Answer:

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

=-9/8

Now
(8/9) X (-9/8) = -1

So it is not the multiplicative inverse

Question 9
Is 0.3 the multiplicative inverse of

$3\frac{1}{3}$

Why or why not?

Answer:

$3\frac{1}{3}$

=10/3

Now
(3/10) X (10/3) =1

So it is the multiplicative inverse

Question 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.

Answer:

i) 0
ii) 1 and -1
iii) 0

Question 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 _____.

Answer:

i) No

ii) 1 and -1

iii) -1/5

iv) X

v) Rational Number

vi) Positive rational number