SpeedLabs

MATHS

CBSE 8th

TEEVRA EDUTECH PVT. LTD.

Rational number
Exercise-1.1

Q.1 Using appropriate properties find.

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

Sol::

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

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

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

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

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

$=-\frac{1}{2}+\frac{5}{2}$

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

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

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

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

$=\frac{2}{5}\times\left(\frac{-6+1}{14}\right)-\frac{1}{4}$

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

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

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

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

Q.2 Write the additive inverse of each of the following.

(i) $\frac{2}{8}$ (ii) $\frac{-5}{9}$ (iii) $\frac{-6}{-5}$ (iv) $\frac{2}{-9}$ (v) $\frac{19}{-6}$

Sol: we know that additive inverse of a rational number $\frac{a}{b}$ is $\left(\frac{-a}{b}\right)$,

Such that $\frac{a}{b}+\frac{(-a)}{b}=0$.

(i) $\frac{2}{8}$

$=\frac{-2}{8}$ is the additive inverse of $\frac{2}{8}$. $\left[\because \frac{2}{8}+\left(-\frac{2}{8}\right)=\frac{2-2}{8}=\frac{0}{8}=0\right]$

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

$\frac{5}{9}$ is the additive inverse of $\frac{5}{9}$. $\left[\because \frac{-5}{9}+\frac{5}{9}=\frac{-5+5}{9}+\frac{0}{9}=0\right]$

(iii) $\frac{-6}{-5}$

$\frac{-6}{5}$ is the additive inverse of $\frac{-6}{-5}$. $\left[\because \frac{-6}{-5}+\left\{-\left(\frac{-6}{-5}\right)\right\}=\frac{6}{5}-\frac{6}{5}=\frac{0}{5}=0\right]$

(v) $\frac{2}{-9}$

$\frac{2}{9}$ is the additive inverse of $\frac{2}{-9}$. $\left[\because \frac{2}{-9}+\left\{-\left(\frac{2}{-9}\right)\right\}=\frac{2}{-9}+\frac{2}{9}=\frac{-2+2}{9}=\frac{0}{9}=0\right]$

(v) $\frac{19}{-6}$

$\frac{19}{6}$ is the additive inverse of $\frac{19}{-6}$. $\left[\because \frac{19}{-6}+\left\{-\left(\frac{19}{-6}\right)\right\}=\frac{-19}{6}+\frac{19}{6}=\frac{-19+19}{6}=\frac{0}{6}=0\right]$

Q.3 Verify that – (-x) = x for.

(i) $x=\frac{11}{15}$ (ii) $x=-\frac{13}{17}$

Sol: According to the equation,

$-(-x)=x$ …… (i)

(i) On putting $x=\frac{11}{5}$, in given equation (i)

L.H.S. $=-\left(-\frac{11}{15}\right)=\frac{11}{15}=$ R. H. S.

$\Rightarrow$ L. H. S. = R. H. S.

Hence, verified

(ii) On putting $x = -\frac{13}{17}$, in given equation (i)

L.H.S. $= -\left\{-\left(-\frac{13}{17}\right)\right\} = -\frac{13}{17} =$ R. H. S.

$\Rightarrow$ L. H. S. $=$ R. H. S.

Hence, verfifed

Q.4 Find the multiplication inverse of the following.

(i) – 13 (ii) $\frac{-13}{19}$ (iii) $\frac{1}{5}$ (iv) $\frac{-5}{8} \times \frac{-3}{7}$ (v) $-1 \times \frac{-2}{5}$ (vi) -1

Sol: We know that multiplicative inverse of a rational number a is $\frac{1}{a}$,

Such that $a \times \frac{1}{a} = 1$.

(i) -13

$\frac{-1}{13}$ is multiplicative inverse of -13. $\left[\because -13 \times \frac{1}{-13} = 1\right]$

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

$\frac{-19}{13}$ is multiplication inverse of $\frac{-13}{19}$. $\left[\because \frac{-13}{19} \times \frac{19}{-13} = 1\right]$

(iii)$\frac{1}{5}$

5 is multiplication inverse of $\frac{1}{5}$. $\left[\because \frac{1}{5} \times 5 = 1\right]$

(iv) $\frac{-5}{8} \times \frac{-3}{7} = \frac{15}{56}$

$\frac{56}{15}$ is multiplicative inverse of $\frac{15}{56}$. $\left[\because \frac{15}{56} \times \frac{56}{15} = 1\right]$

(v) $-1 \times \frac{-2}{5} = \frac{+2}{5}$

$\frac{5}{2}$ is multiplication inverse of $\frac{2}{5}$. $\left[\because \frac{2}{5} \times \frac{5}{2} = 1\right]$

(vi) -1

$\frac{1}{-1}$ is multiplication inverse of (-1). $\left[\because (-1) \times \left(\frac{1}{-1}\right) = 1\right]$

Q.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) $\frac{-19}{29} \times \frac{29}{-19} = 1$

Sol: (i) 1 is multiplicative identity.

(ii) Commutatively.

(iii) Multiplicative inverse.

Q.6 Multiply $\frac{6}{13}$ by the reiprocal of $\frac{-7}{16}$.

Sol: The reciprocal of $\frac{-7}{16}$ is $\frac{-16}{7}$.

According to the condition, $\frac{6}{13} \times \left(\frac{-16}{7}\right) = \frac{-96}{91}$.

Q.7 Tell what property allows you to compute $\frac{1}{3} \times \left(6 \times \frac{4}{3}\right)$ as $\left(\frac{1}{3} \times 6\right) \times \frac{4}{3}$.

Sol: By associativity property of multiplication, as we know that

$a \times (b \times c) = (a \times b) \times c$.

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

Sol: We have, $\frac{8}{9} \times \left(-1\frac{1}{8}\right) = \frac{8}{9} \times \frac{-9}{8} = -1$.

Its product must be positive 1.

So, $\frac{8}{9}$ is not multiplicative inverse of $-1\frac{1}{8}$.

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

Sol: We have, $0.3 \times 3\frac{1}{3} = \frac{3}{10} \times \frac{10}{3} = 1$

Yes, its product is 1, so 0.3 is the multiplicative inverse of $3\frac{1}{3}$.

Q.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.

Sol: (i) 0 is a rational number but its reciprocal is not defined.

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

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

Q.11 Fill in the blanks.

(i) Zero has _____ reciprocal.

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

(iii) The reciprocal of -5 is ___.

(iv) The reciprocal of $\frac{1}{x}$, where $x \neq 0$ is ____.

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

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

Sol: (i) No

(ii) 1, -1

(iii) $\frac{-1}{5}$

(iv) x

(v) Rational number

(vi) Positive