Exercise 1.1

Q1. Using appropriate properties find:

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

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

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

[Using associative property]

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

[Using distributive property]

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

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

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

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

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

[Using associative property]

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

[Using distributive property]

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

$$= \frac{-1}{7} - \frac{1}{4} = \frac{-4-7}{28} = \frac{-11}{28}$$

Q2. 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) $\frac{19}{-6}$

Ans: We know that additive inverse of a rational number $\frac{a}{b}$ is $\left(\frac{-a}{b}\right)$, such that $\frac{a}{b}+\left(\frac{-a}{b}\right)=0$.

(i) Additive inverse of $\frac{2}{8}$ is $\frac{-2}{8}$.

(ii) Additive inverse of $\frac{-5}{9}$ is $\frac{5}{9}$.

(iii) Additive inverse of $\frac{-6}{-5}$ is $\frac{-6}{5}$.

(iv) Additive inverse of $\frac{2}{-9}$ is $\frac{2}{9}$.

(v) Additive inverse of $\frac{19}{-6}$ is $\frac{19}{6}$.

Q3. Verify that $-(-x)=x$ for:

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

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

Ans: (i) Putting $x=\frac{11}{15}$ in $-(-x)=x$,

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

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

Hence, verified.

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

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

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

Hence, verified.

Q4. Find the multiplicative 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

Ans: We know that multiplicative inverse of a rational number a is $\left(\frac{1}{a}\right)$, such that $a\times\frac{1}{a}=1$.

(i) Multiplicative inverse of -13 is $\frac{-1}{13}$.

(ii) Multiplicative inverse of $\frac{-13}{19}$ is $\frac{-19}{13}$.

(iii) Multiplicative inverse of $\frac{1}{5}$ is 5.

(iv) Multiplicative inverse of $\frac{-5}{8}\times\frac{-3}{7}=\frac{15}{56}$ is $\frac{56}{15}$.

(v) Multiplicative inverse of $-1\times\frac{-2}{5}=\frac{2}{5}$ is $\frac{5}{2}$.

(vi) Multiplicative inverse of -1 is $\frac{1}{-1}$.

Q5. Name the property under multiplication used in each of the following:

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

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

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

Ans: (i) 1 is the multiplicative identity.

(ii) Commutative property.

(iii) Multiplicative Inverse property.

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

Ans 6.The reciprocal of $\frac{-7}{16}$ is $\frac{-16}{7}$.

According to the question,

$\frac{6}{13} \times \left(\frac{-16}{7}\right) = \frac{-96}{91}$

Q7. Tell what property allows you to compute $\frac{1}{3}\times\left(6\times\frac{4}{3}\right)$ as $\left(\frac{1}{3}\times 6\right)\times\frac{4}{3}$.

Ans: By using associative property of multiplication, we will compute as $a\times(b\times c)=(a\times b)\times c$.

Q8. Is $\frac{8}{9}$ the multiplicative inverse of $-1\frac{1}{8}$?

Why or why not?

Ans: Since multiplicative inverse of a rational number a is $\left(\frac{1}{a}\right)$, if $a\times\frac{1}{a}=1$.

Therefore, $\frac{8}{9}\times\left(-1\frac{1}{8}\right)=\frac{8}{9}\times\frac{-9}{8}=-1$

But its product must be positive 1.

Therefore, $\frac{8}{9}$ is not the multiplicative inverse of $\left(-1\frac{1}{8}\right)$.

Q9. Is 0.3 the multiplicative inverse of $3\frac{1}{3}$?

Why or why not?

Ans: Since multiplicative inverse of a rational number a is $\left(\frac{1}{a}\right)$, if $a \times \frac{1}{a} = 1$.

Therefore, $0.3 \times 3\frac{1}{3} = \frac{3}{10} \times \frac{10}{3} = 1$

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

Q10. 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.

Ans: (i) 0

(ii) 1 and -1

(iii) 0

Q11. 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 $\frac{1}{x}$, where $x \neq 0$ is _____.

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

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

Ans: (i) No

(ii) 1, -1

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

(iv) x

(v) Rational Number

(vi) Positive

********** END **********