



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]

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

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

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

**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

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

**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  $a \times \frac{1}{a} = 1$ .

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

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

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

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 \*\*\*\*\*