

## EXERCISE 1.1



1. Write the additive inverse of each of the following:

(a)  $\frac{7}{5}$

(b)  $\frac{-6}{11}$

(c)  $\frac{14}{-15}$

2. Identify the property used in the following:

(a)  $\frac{13}{21} + \left(\frac{-13}{21}\right) = 0 = \left(\frac{-13}{21}\right) + \frac{13}{21}$

(b)  $\frac{4}{11} + \frac{3}{7} = \frac{3}{7} + \frac{4}{11}$

(c)  $\frac{2}{3} + \left(\frac{4}{5} + \frac{-6}{7}\right) = \left(\frac{2}{3} + \frac{4}{5}\right) + \frac{-6}{7}$

3. Verify  $[-(-x)] = x$  for the following values:

(a)  $x = \frac{11}{5}$

(b)  $x = \frac{-6}{7}$

4. Verify the closure property of addition for the following pair of integers:

(a)  $\frac{-7}{8}$  and  $\frac{3}{5}$

(b)  $\frac{-5}{7}$  and  $\frac{-3}{14}$

5. Verify that  $a + b = b + a$  for each of the following:

(a)  $a = \frac{-9}{11}$ ;  $b = \frac{-4}{11}$

(b)  $a = \frac{4}{5}$ ;  $b = \frac{-3}{10}$

6. Check that  $a - b \neq b - a$  for each of the following:

(a)  $a = \frac{-2}{3}$ ;  $b = \frac{-7}{15}$

(b)  $a = \frac{2}{9}$ ;  $b = \frac{-1}{3}$

7. If  $a = \frac{-4}{13}$  and  $b = \frac{2}{5}$ , then verify that  $(-a) + (-b) = -(a + b)$ .

8. Verify the associative property of addition for the following rational numbers:

(a)  $\frac{-1}{2}$ ,  $\frac{2}{3}$ ,  $\frac{5}{6}$

(b)  $\frac{7}{15}$ ,  $\frac{-4}{5}$ ,  $\frac{2}{3}$

9. If  $a = \frac{-4}{7}$ ,  $b = \frac{2}{21}$ , and  $c = \frac{1}{3}$  then check that  $(a - b) - c \neq a - (b - c)$ .

10. Find the sum of the additive inverse of  $\frac{4}{9}$  and  $\frac{-2}{3}$ .

## EXERCISE 1.2



1. Write the multiplicative inverse of the following:

(a)  $-2$                       (b)  $\frac{-3}{5}$                       (c)  $5 \times \frac{-9}{10}$                       (d)  $\frac{4}{9} \times \frac{2}{3}$

2. Identify and write the name of the property used in each of the following:

(a)  $\frac{6}{7} \times \frac{5}{8} = \frac{5}{8} \times \frac{6}{7}$

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

(c)  $\frac{7}{9} \times \left(\frac{2}{3} + \frac{1}{4}\right) = \frac{7}{9} \times \frac{2}{3} + \frac{7}{9} \times \frac{1}{4}$

(d)  $\left(\frac{6}{11} \times \frac{3}{7}\right) \times \frac{1}{2} = \frac{6}{11} \times \left(\frac{3}{7} \times \frac{1}{2}\right)$

3. Verify the commutative property of multiplication for the following pairs of rational numbers:

(a)  $-\frac{12}{13}$  and  $-\frac{2}{3}$

(b)  $7$  and  $\frac{-6}{7}$

(c)  $\frac{2}{11}$  and  $\frac{3}{5}$

(d)  $\frac{-4}{5}$  and  $\frac{10}{11}$

4. Check that  $a \div b \neq b \div a$  for each of the following:

(a)  $a = \frac{-5}{4}$ ,  $b = \frac{-3}{4}$

(b)  $a = \frac{5}{8}$ ,  $b = \frac{-5}{16}$

5. Verify the property  $a \times (b - c) = a \times b - a \times c$  for each of the following:

(a)  $a = \frac{-3}{5}; b = \frac{5}{9}; c = \frac{-10}{3}$

(b)  $a = \frac{5}{15}; b = \frac{-8}{15}; c = \frac{4}{5}$

6. Verify the property  $a \times (b \times c) = (a \times b) \times c$  for each of the following:

(a)  $a = 3\frac{1}{4}; b = \frac{-2}{13}; c = \frac{1}{2}$

(b)  $a = \frac{-3}{5}; b = \frac{3}{7}; c = \frac{-5}{6}$

7. Verify that  $a \times 0 = 0 = 0 \times a$  for each of the following:

(a)  $a = \frac{-4}{7}$

(b)  $a = \frac{-8}{13}$

8. Find the product of the multiplicative inverse of  $\frac{-9}{11}$  and  $\frac{22}{3}$ .

### EXERCISE 1.3



1. Represent the following rational numbers on a number line:

(a)  $\frac{5}{7}$

(b)  $\frac{-2}{5}$

(c)  $3\frac{1}{4}$

(d)  $-1\frac{5}{9}$

2. Represent  $\frac{2}{3}$  and  $\frac{-2}{3}$  on the same number line. Are these points equidistant from the origin?

3. Arrange the following rational numbers in ascending order:

(a)  $\frac{-3}{4}, \frac{2}{5}, \frac{16}{15}, \frac{-1}{3}$

(b)  $3\frac{4}{5}, \frac{-2}{5}, \frac{16}{15}, \frac{-1}{3}$

4. Arrange the following rational number in a descending order:

(a)  $\frac{7}{20}, \frac{-4}{5}, \frac{3}{4}, \frac{-1}{10}$

(b)  $\frac{-5}{8}, \frac{3}{4}, \frac{-1}{2}, \frac{-9}{16}$

5. Find three rational numbers between  $(-6)$  and  $(-7)$ .

6. Find five rational numbers between  $\frac{1}{3}$  and  $\left(\frac{-1}{4}\right)$ .

7. Find seven rational numbers between  $\frac{-7}{9}$  and  $\frac{-1}{3}$ .

8. Find four rational numbers between 1.5 and 1.7.

9. Use the average method to check if  $\frac{5}{16}$  exists between  $\frac{1}{4}$  and  $\frac{3}{8}$ .

10. Write nine rational numbers between  $x$  and  $|x|$ , where  $x = \frac{-6}{11}$ .

## EXERCISE 1.4



1. Radhika embroiders a saree in  $5\frac{1}{2}$  days. How many days will it take for her to embroider four such sarees?
2. A cyclist covers a distance of  $15\frac{3}{4}$  km in a day. How much distance will be covered in  $5\frac{1}{7}$  days?
3. In a factory  $\frac{3}{8}$  of the workers are females. If there are 600 workers in all, then find the number of male workers.
4. A train at a uniform speed covers a distance of 240 km in  $2\frac{1}{2}$  hours. Find the speed of the train and also the distance travelled by the train in 6 hours.
5. The product of two rational numbers is  $\left(\frac{-18}{75}\right)$ . If one of the rational number is  $\left(\frac{-9}{20}\right)$ , then find the other.
6. Ayush takes half an hour to reach his school if he walks at a uniform speed of  $3\frac{1}{5}$  km/h. Find the distance covered by him.
7. A book has 350 pages. Neeta has read  $\frac{5}{7}$  of the book. Find the remaining number of pages to be read by Neeta.
8. Multiply the sum of  $\frac{6}{7}$  and  $\frac{-13}{21}$  by their difference.

9. Divide the sum of  $\frac{85}{91}$  and  $\frac{5}{13}$  by their difference.

10. A rectangular plot of land is  $25\frac{3}{4}$  m long and  $15\frac{2}{3}$  m wide. Find the perimeter and area of the plot.