CHAPTER 1

RATIONAL NUMBERS

- Rational numbers are closed under the operations of addition, subtraction and multiplication.
- The rational number 0 is the additive identity for rational numbers.
- The rational number 1 is the multiplicative identity for rational number.
- The additive inverse of rational number $\frac{a}{b}$ is $\frac{-a}{b}$ and vice versa.
- The multiplicative inverse of the rational number $\frac{a}{b}$ is $\frac{b}{a}$ and vice versa.

QUESTIONS

1. Ramesh's camera was loaded with a new roll of film. The film can take 36 snaps. During the class picnic he took 20 pictures. What fraction of the roll can still be used to take snaps.
2. What fraction is 20 paisa of Rs. 6.20?
3. Which is not a rational number

   (*a*) $\frac{22}{39}$ (*b*) $\frac{731}{0}$ (*c*) 288 (*d*) $8\frac{1}{3}$

4. Find $\frac{5}{12} + \frac{3}{8}$.
5. Find $\frac{-2}{15} + \frac{7}{30}$.
6. What is the additive inverse of $\frac{-4}{9}$.
7. Find x if

   $$\frac{13}{11} \times \frac{22}{39} \times x = \frac{1}{9}.$$

8. Find $\frac{-5}{48} + \frac{-11}{24}$.

9. If a and b are rational numbers then which is not always true

   (a) $a + b$ is a rational number

   (b) $a - b$ is a rational number

   (c) $a \times b$ is a rational number

   (d) $a \div b$ is a rational number.

10. Find $\frac{3}{4} \div \frac{-7}{48}$.

11. Complete the following :

$$\frac{a}{b} + \square = 0$$

12. Find $3\frac{1}{7} + \frac{-5}{14}$.

13. Complete the following :

$$\square + 0 = -\left(\frac{-5}{8}\right).$$

14. Find out the missing number :

$$\frac{3}{7} \times \frac{x}{7} \times \frac{7}{45} = \frac{1}{21}.$$

15. What is the value of $\frac{3}{4} \times \frac{2}{5} + \frac{3}{4} \times \frac{3}{5}$.

16. What is the value of $\frac{1}{2} + \frac{1}{2} \div \frac{1}{2}$.

17. Find the multiplicative inverse of $4\frac{2}{3}$.

18. What is the value of $\frac{17}{9} \times \frac{-2}{3} + \frac{17}{9} \times \frac{8}{3} - \frac{34}{9}$.

19. The product of two rational numbers is $\frac{15}{11}$. If one rational number is $\frac{5}{9}$ then find the other.

20. What is the multiplicative inverse of $\frac{-11}{3} \times \frac{-4}{5}$.

21. What is the value of $\frac{3}{8} \times \left(\frac{-5}{7}\right) + \frac{3}{7} + \frac{3}{8} \times \frac{4}{7}$.

22. What is the value of $1 - \frac{1}{2} \times 2$.

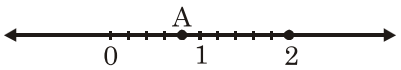
23. Find the missing number 'y'

$$\frac{-3}{2} + \frac{7}{5} = y - \frac{3}{2}.$$

24. What is the multiplicative inverse of $-2\frac{2}{7}$.

25. Simplify $\left(\frac{15}{17} + \frac{21}{34}\right) + \frac{9}{34}$.

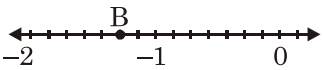
26. What number should be added to $\frac{15}{16}$ so that we get the rational number $\frac{77}{48}$.

27. 

Which number is A?

28. Simplify : $\frac{-8}{15} + \frac{4}{5} - 4 + \frac{23}{15} - \frac{9}{5}$.

29. How many ribbons of $\frac{11}{10}$ m can be cut from a ribbon of length $5\frac{1}{2}$ m?

30. 

Which number is B?

31. Which number lies between $\frac{1}{3}$ and $\frac{1}{2}$

(*a*) $\frac{1}{4}$ (*b*) $\frac{23}{60}$ (*c*) $\frac{1}{5}$ (*d*) $\frac{1}{6}$.

32. Find the missing number x

$$\frac{5}{6} + \frac{8}{3} = \frac{8}{3} - x.$$

33. Complete the following :

$$\square + \left(\frac{-4}{9}\right) = \frac{-4}{9}.$$

34. Simplify : $12\frac{2}{3} \times 2\frac{1}{2} \times \frac{-5}{8} \times \frac{0}{3} \times \frac{8}{5}$.

35. Which number should be subtracted from $\frac{11}{12}$ so that we obtain $\frac{-3}{4}$?

36. Simplify : $\frac{1}{3} + \left(\frac{-3}{4}\right) + \frac{7}{8}$.

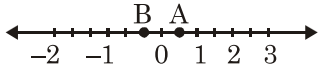
37. What is the reciprocal of $8 \times \frac{3}{2}$.

38. Identify the property of multiplication associated with the following statement.

$$\frac{1}{7} \times \frac{7}{1} = 1.$$

39. What is the value of $\left(\frac{2}{3} + \frac{3}{4}\right) + \frac{1}{4}$

40. Simplify : $\left(\frac{-6}{7} \times \frac{4}{5}\right) \times \left(\frac{-5}{8}\right)$.

41. 

What is $A + B$.

42. What is the multiplicative inverse of $\left(\frac{-4}{7}\right) \times \left(\frac{-7}{4}\right)$.

43. Which rational number has no reciprocal?

44. Which of the following rational number lies between the rational numbers a and b.

(*a*) $\frac{a+b}{2}$ (*b*) $a + b$ (*c*) $\frac{a+b}{3}$ (*d*) $\frac{1}{2}a + b$.

45. Simplify : $\frac{3}{8} \times \frac{-11}{5} + \frac{3}{8} \times \frac{1}{5} - \frac{11}{4}$.

46. A designer needs $\frac{3}{5}$ th of a metre of cloth to make a fancy dress for children taking part in a dance performance. If 200 children are taking part, how much cloth will the designer need?

47. Fill up the blank boxes of the magic square such that the sum of the numbers taken vertically, horizontally and diagonally remains the same.

	$2\frac{1}{2}$	6
	$4\frac{1}{2}$	
3		

48. Find a rational number between $\frac{1}{2}$ and $\frac{1}{4}$ such that its denominator is 8.

49. Simplify : $\frac{7}{8} \times 1\frac{1}{7} = \square$

50. Simplify : $\frac{2}{9} \times \frac{7}{10} - 1 + \frac{2}{9} \times \frac{1}{5} + \frac{4}{5}$.

ANSWERS

1. $\frac{4}{9}$
2. $\frac{1}{31}$
3. (*b*)
4. $\frac{19}{24}$
5. $\frac{1}{10}$
6. $\frac{4}{9}$
7. $\frac{1}{6}$
8. $\frac{-9}{16}$
9. (*d*)
10. $\frac{-36}{7}$
11. $\frac{-a}{b}$
12. $\frac{39}{14}$
13. $\frac{5}{8}$
14. (5)
15. $\frac{3}{4}$
16. $\frac{3}{2}$
17. $\frac{3}{14}$
18. 0
19. $\frac{27}{11}$
20. $+\frac{15}{44}$
21. $\frac{21}{56} = \frac{3}{8}$
22. 0
23. $\frac{7}{5}$
24. $\frac{-7}{16}$
25. $\frac{30}{17}$
26. $\frac{2}{3}$
27. $\frac{4}{5}$
28. –4

29. 5

30. $\frac{-9}{7}$

31. (*b*)

32. $\frac{-5}{6}$

33. 0

34. 0

35. $\frac{5}{3}$

36. $\frac{11}{24}$

37. $\frac{1}{12}$

38. Multiplicative inverse.

39. $\frac{5}{3}$

40. $\frac{3}{7}$

41. $\frac{1}{6}$

42. 1

43. 0

44. (*a*)

45. $\frac{-14}{4} = \frac{-7}{2}$

46. 120m

47.

5	$2\frac{1}{2}$	6
$5\frac{1}{2}$	$4\frac{1}{2}$	$3\frac{1}{2}$
3	$6\frac{1}{2}$	4

48. $\frac{3}{8}$

49. 1

50. 0

TEST YOUR KNOWLEDGE

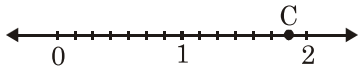
1. $\frac{11}{6} + \frac{3}{-4} = \square$

2. $0.3 \times 3\frac{1}{3} = \square$

3. What is the multiplicative inverse of $-1\frac{1}{7}$.

4. Find x if $\frac{5}{8} \div x = \frac{25}{24}$.

5. The sum of two rational number is $\frac{9}{13}$. If one of them is $\frac{5}{26}$ then find the other rational number.

6. 

which number is *C*.

7. Which number lies between $\frac{1}{10}$ and $\frac{1}{100}$.

(*a*) $\frac{2}{10}$ (*b*) $\frac{2}{100}$ (*c*) $\frac{10}{2}$ (*d*) $\frac{100}{2}$

8. What is the value of $3 \times \frac{1}{3} + \frac{1}{3} \div \frac{1}{3}$.

9. Simplify : $\left(\frac{-13}{12} + \frac{23}{24}\right) + \frac{11}{24}$.

10. Simplify : $11\frac{1}{2} \times 2\frac{1}{2} \times \frac{4}{5}$.

ANSWERS

1. $\frac{13}{12}$
2. 1.
3. $\frac{-7}{8}$
4. $\frac{3}{5}$
5. $\frac{1}{2}$
6. $\frac{13}{7}$
7. (*b*)
8. 2
9. $\frac{1}{3}$
10. 23.