

CHAPTER - FRACTIONSProper fraction

A proper fraction is a fraction that represents a part of a whole

E.g. →  $\frac{2}{3}$ ,  $\frac{1}{2}$ ,  $\frac{3}{7}$  etc

NOTE In a proper fraction,  
denominator > numerator (always)

Improper fraction

An improper fraction is a combination of whole and a proper fraction.

E.g. →  $\frac{7}{4}$ ,  $\frac{9}{13}$ ,  $\frac{2}{7}$  etc.

NOTE In an improper fraction,  
numerator > denominator (always)

Mixed fraction

An improper fraction can be separated into its whole and proper part

E.g. →  $\frac{7}{4}$  can be written as  $1\frac{3}{4}$

This is a mixed fraction.

E.g. → Write five equivalent fractions of  $\frac{2}{3}$

Solution Equivalent fractions of  $\frac{2}{3}$  are -

$$\frac{2 \times 1}{3 \times 1} = \frac{2}{3}$$

$$\frac{2 \times 2}{3 \times 2} = \frac{4}{6}$$

$$\frac{2 \times 4}{3 \times 4} = \frac{8}{12}$$

$$\frac{2 \times 3}{3 \times 3} = \frac{6}{9}$$

$$\frac{2 \times 5}{3 \times 5} = \frac{10}{15} \text{ etc.}$$

## Addition and Subtraction of fractions

E.g. → Add:  $\frac{1}{5} + \frac{3}{4}$

Solution Taking L.C.M. of 5 and 4, we get 20  
$$= \frac{4+15}{20} = \frac{19}{20}$$

E.g. → Add:  $8\frac{1}{2} + 3\frac{5}{8}$

Solution  $8\frac{1}{2} = \frac{17}{2}$ ,  $3\frac{5}{8} = \frac{29}{8}$

Taking L.C.M. of 2 & 8, we get 8

$$= \frac{17 \times 4 + 29 \times 1}{8} = \frac{68 + 29}{8} = \frac{97}{8}$$

$$= \underline{12}$$

E.g. → Subtract:  $\frac{23}{3} - \frac{7}{2}$

Solution Taking L.C.M of 3 and 2, we get 6.

$$= \frac{23 \times 2 - 7 \times 3}{6} = \frac{46 - 21}{6}$$

$$= \frac{25}{6} = 4 \frac{1}{6}$$

E.g. Subtract:  $3 \frac{1}{2} - 2$

Solution  $3 \frac{1}{2} = \frac{7}{2}$ ,  $2 = \frac{2}{1}$

Taking L.C.M. of 2 and 1, we get 2

$$= \frac{7 - 2 \times 2}{2} = \frac{7 - 4}{2} = \frac{3}{2}$$

$$= 1 \frac{1}{2}$$

### WORD PROBLEMS

E.g. Sam purchased  $3 \frac{1}{2}$  kg grapes and  $4 \frac{3}{4}$  kg apples. What is the total

weight of fruits purchased by her?

Sol<sup>n</sup> →

The total weight of fruits =  
weight of grapes + weight of apples

$$= \left( 3 \frac{1}{2} + 4 \frac{3}{4} \right) \text{ kg} = \frac{7}{2} + \frac{19}{4}$$

$$= \frac{7 \times 2 + 19}{4} = \frac{14 + 19}{4} = \frac{33}{4} \text{ kg}$$

$$= 8 \frac{1}{4} \text{ kg}$$

E.g. Ram solved  $\frac{2}{7}$  part of an exercise while Seema solved  $\frac{4}{5}$  of it. Who solved lesser part? and by how much?

Solution Let us compare  $\frac{2}{7}$  and  $\frac{4}{5}$ .

Converting them to like fractions,

$$\text{we have } \frac{2}{7} = \frac{10}{35}, \quad \frac{4}{5} = \frac{28}{35}$$

$$\text{Since } 10 < 28 \quad \text{so } \frac{10}{35} < \frac{28}{35}$$

$$\text{Thus } \frac{2}{7} < \frac{4}{5}$$

Hence Ram solved lesser part than

$$\text{Seema by } \frac{4}{5} - \frac{2}{7} = \frac{28}{35} - \frac{10}{35} \\ = \frac{18}{35}$$

## Like and Unlike Fractions

# fractions having same denominators are called like fractions.

E.g.  $\frac{1}{2}, \frac{3}{2}, \frac{7}{2}$  are like fractions.

$\frac{2}{14}, \frac{3}{14}, \frac{9}{14}$  are like fractions etc.

# fractions having different denominators are called unlike fractions.

E.g. →  $\frac{1}{2}, \frac{1}{4}, \frac{2}{3}$  are unlike fractions.

$\frac{3}{8}, \frac{2}{3}, \frac{3}{5}$  are unlike fractions.

### Comparison of fractions

To compare two or more fractions they must be like fractions.

After converting them into like fractions we can compare them by directly comparing their numerators.

E.g. → Arrange the fractions in ascending order  
 $\frac{2}{3}, \frac{13}{9}, \frac{1}{2}, \frac{3}{5}$

Solution They all are unlike fractions. We need to convert them into like fractions. So taking L.C.M. of 3, 9, 2 and 5, we get 90

Now,

$$\frac{2 \times 30}{90}, \frac{13 \times 10}{90}, \frac{1 \times 45}{90}, \frac{3 \times 18}{90}$$

$$= \frac{60}{90}, \frac{130}{90}, \frac{45}{90}, \frac{54}{90}$$

$$= \frac{60}{90}, \frac{130}{90}, \frac{45}{90}, \frac{54}{90} \text{ are like fractions.}$$

Arranging them in ascending order we get

$$\frac{45}{90}, \frac{54}{90}, \frac{60}{90}, \frac{130}{90}$$

replacing these fractions with the original ones, we get

$$\frac{1}{2} < \frac{3}{5} < \frac{2}{3} < \frac{13}{9}$$

### EXERCISE

(1) Solve:

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

(b)  $4 + \frac{7}{8}$

(c)  $\frac{3}{5} + \frac{2}{7}$

(d)  $\frac{9}{11} - \frac{4}{15}$

(e)  $\frac{7}{10} + \frac{2}{5} + \frac{3}{2}$

(f)  $2\frac{2}{3} + 3\frac{1}{2}$

(g)  $8\frac{1}{2} - 3\frac{5}{8}$

(h)  $\frac{3}{10} - 2\frac{1}{5} + 2\frac{1}{3}$

(i)  $5\frac{2}{3} - 2\frac{4}{5} \div 3\frac{1}{5}$

(2) Arrange the following in descending order.

(a)  $\frac{2}{9}, \frac{2}{3}, \frac{8}{21}$

(b)  $\frac{1}{5}, \frac{3}{7}, \frac{7}{10}$

(c)  $2\frac{1}{3}, \frac{1}{6}, 3\frac{1}{3}$

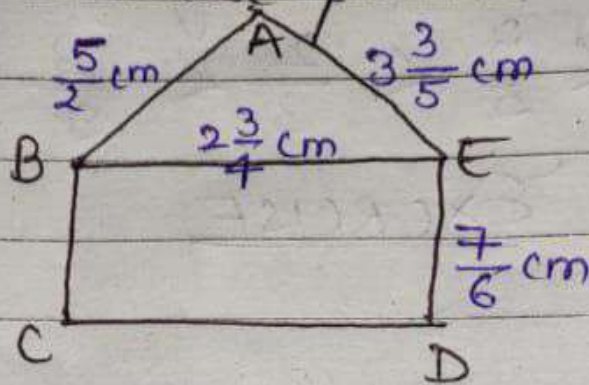
(d)  $3, 7\frac{1}{3}, 2\frac{1}{9}$

(3) A rectangular sheet of paper is  $12\frac{1}{2}$  cm long and  $10\frac{2}{3}$  cm wide. Find its perimeter.

[Hint: Perimeter of rectangle  
=  $2(l+b)$ ]

(7)

- ④ Find the perimeter of (i)  $\triangle ABE$  (ii) rectangle BCDE. Whose perimeter is greater?



- ⑤ Salil wants to put a picture in a frame. The picture is  $7\frac{3}{5}$  cm wide. To fit in the frame the picture cannot be more than  $7\frac{3}{10}$  cm wide. How much should the picture be trimmed?

- ⑥ Ritu ate  $\frac{3}{5}$  part of an apple and the remaining apple was eaten by her brother Somu. How much part of the apple did Somu eat? Who had the larger share? By how much?

- ⑦ Mira finished colouring a picture in  $\frac{7}{12}$  hour. Vira finished colouring the same picture in  $\frac{3}{4}$  hour. Who worked longer? By what fraction was it longer?