

**2** MATHEMATICS

2. Multiply and reduce to lowest form (if possible) :

(i)  $\frac{2}{3} \times 2\frac{2}{3}$       (ii)  $\frac{2}{7} \times \frac{7}{9}$       (iii)  $\frac{3}{8} \times \frac{6}{4}$       (iv)  $\frac{9}{5} \times \frac{3}{5}$   
(v)  $\frac{1}{3} \times \frac{15}{8}$       (vi)  $\frac{11}{2} \times \frac{3}{10}$       (vii)  $\frac{4}{5} \times \frac{12}{7}$

3. Multiply the following fractions:

(i)  $\frac{2}{5} \times 5\frac{1}{4}$       (ii)  $6\frac{2}{5} \times \frac{7}{9}$       (iii)  $\frac{3}{2} \times 5\frac{1}{3}$       (iv)  $\frac{5}{6} \times 2\frac{3}{7}$   
(v)  $3\frac{2}{5} \times \frac{4}{7}$       (vi)  $2\frac{3}{5} \times 3$       (vii)  $3\frac{4}{7} \times \frac{3}{5}$

4. Which is greater:

(i)  $\frac{2}{7}$  of  $\frac{3}{4}$  or  $\frac{3}{5}$  of  $\frac{5}{8}$       (ii)  $\frac{1}{2}$  of  $\frac{6}{7}$  or  $\frac{2}{3}$  of  $\frac{3}{7}$

5. Saili plants 4 saplings, in a row, in her garden. The distance between two adjacent saplings is  $\frac{3}{4}$  m. Find the distance between the first and the last sapling.

6. Lipika reads a book for  $1\frac{3}{4}$  hours everyday. She reads the entire book in 6 days. How many hours in all were required by her to read the book?

7. A car runs 16 km using 1 litre of petrol. How much distance will it cover using  $2\frac{3}{4}$  litres of petrol.

8. (a) (i) Provide the number in the box  $\square$ , such that  $\frac{2}{3} \times \square = \frac{10}{30}$ .

(ii) The simplest form of the number obtained in  $\square$  is \_\_\_\_\_.

(b) (i) Provide the number in the box  $\square$ , such that  $\frac{3}{5} \times \square = \frac{24}{75}$ .

(ii) The simplest form of the number obtained in  $\square$  is \_\_\_\_\_.

**2.4 DIVISION OF FRACTIONS**

John has a paper strip of length 6 cm. He cuts this strip in smaller strips of length 2 cm each. You know that he would get  $6 \div 2 = 3$  strips.





The two squares are exactly similar.

Each shaded portion represents  $\frac{1}{2}$  of 1.

So, both the shaded portions together will represent  $\frac{1}{2}$  of 2.

Combine the 2 shaded  $\frac{1}{2}$  parts. It represents 1.

So, we say  $\frac{1}{2}$  of 2 is 1. We can also get it as  $\frac{1}{2} \times 2 = 1$ .

Thus,  $\frac{1}{2}$  of 2 =  $\frac{1}{2} \times 2 = 1$

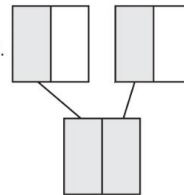


Fig 2.6

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Also, look at these similar squares (Fig 2.7).

Each shaded portion represents  $\frac{1}{2}$  of 1.

So, the three shaded portions represent  $\frac{1}{2}$  of 3.

Combine the 3 shaded parts.

It represents  $1\frac{1}{2}$  i.e.,  $\frac{3}{2}$ .

So,  $\frac{1}{2}$  of 3 is  $\frac{3}{2}$ . Also,  $\frac{1}{2} \times 3 = \frac{3}{2}$ .

Thus,  $\frac{1}{2}$  of 3 =  $\frac{1}{2} \times 3 = \frac{3}{2}$ .

So we see that 'of' represents multiplication.

Farida has 20 marbles. Reshma has  $\frac{1}{5}$ th of the number of marbles what Farida has. How many marbles Reshma has? As, 'of' indicates multiplication,

so, Reshma has  $\frac{1}{5} \times 20 = 4$  marbles.

Similarly, we have  $\frac{1}{2}$  of 16 is  $\frac{1}{2} \times 16 = \frac{16}{2} = 8$ .

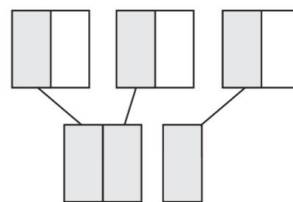


Fig 2.7



### TRY THESE

Can you tell, what is (i)  $\frac{1}{2}$  of 10?, (ii)  $\frac{1}{4}$  of 16?, (iii)  $\frac{2}{5}$  of 25?



**EXAMPLE 5** In a class of 40 students  $\frac{1}{5}$  of the total number of students like to study

English,  $\frac{2}{5}$  of the total number like to study Mathematics and the remaining students like to study Science.

- How many students like to study English?
- How many students like to study Mathematics?
- What fraction of the total number of students like to study Science?

**SOLUTION** Total number of students in the class = 40.



students like to study Science.

- (i) How many students like to study English?
- (ii) How many students like to study Mathematics?
- (iii) What fraction of the total number of students like to study Science?

**SOLUTION** Total number of students in the class = 40.

- (i) Of these  $\frac{1}{5}$  of the total number of students like to study English.

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Thus, the number of students who like to study English =  $\frac{1}{5}$  of 40 =  $\frac{1}{5} \times 40 = 8$ .

- (ii) Try yourself.
- (iii) The number of students who like English and Mathematics = 8 + 16 = 24. Thus, the number of students who like Science = 40 - 24 = 16.

Thus, the required fraction is  $\frac{16}{40}$ .

**EXERCISE 2.2**

1. Which of the drawings (a) to (d) show :

- (i)  $2 \times \frac{1}{5}$
- (ii)  $2 \times \frac{1}{2}$
- (iii)  $3 \times \frac{2}{3}$
- (iv)  $3 \times \frac{1}{4}$



(a) (b)

(c) (d)

2. Some pictures (a) to (c) are given below. Tell which of them show:

- (i)  $3 \times \frac{1}{5} = \frac{3}{5}$
- (ii)  $2 \times \frac{1}{3} = \frac{2}{3}$
- (iii)  $3 \times \frac{3}{4} = 2\frac{1}{4}$

(a) (b)

(c)

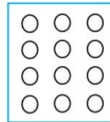
3. Multiply and reduce to lowest form and convert into a mixed fraction:

- (i)  $7 \times \frac{3}{5}$
- (ii)  $4 \times \frac{1}{3}$
- (iii)  $2 \times \frac{6}{7}$
- (iv)  $5 \times \frac{2}{9}$
- (v)  $1 \times \frac{1}{2}$
- (vi)  $\frac{5}{2} \times 6$
- (vii)  $11 \times \frac{4}{7}$
- (viii)  $20 \times \frac{4}{5}$
- (ix)  $13 \times \frac{1}{3}$
- (x)  $1 \times \frac{1}{2}$

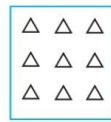




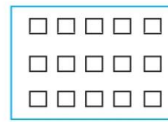
4. Shade: (i)  $\frac{1}{2}$  of the circles in box (a) (ii)  $\frac{2}{3}$  of the triangles in box (b)  
(iii)  $\frac{3}{5}$  of the squares in box (c).



(a)



(b)



(c)

5. Find:

(a)  $\frac{1}{2}$  of (i) 24 (ii) 46 (b)  $\frac{2}{3}$  of (i) 18 (ii) 27

(c)  $\frac{3}{4}$  of (i) 16 (ii) 36 (d)  $\frac{4}{5}$  of (i) 20 (ii) 35

6. Multiply and express as a mixed fraction :

(a)  $3 \times 5\frac{1}{5}$  (b)  $5 \times 6\frac{3}{4}$  (c)  $7 \times 2\frac{1}{4}$

(d)  $4 \times 6\frac{1}{3}$  (e)  $3\frac{1}{4} \times 6$  (f)  $3\frac{2}{5} \times 8$

7. Find: (a)  $\frac{1}{2}$  of (i)  $2\frac{3}{4}$  (ii)  $4\frac{2}{9}$  (b)  $\frac{5}{8}$  of (i)  $3\frac{5}{6}$  (ii)  $9\frac{2}{3}$

8. Vidya and Pratap went for a picnic. Their mother gave them a water bottle that contained 5 litres of water. Vidya consumed  $\frac{2}{5}$  of the water. Pratap consumed the remaining water.  
(i) How much water did Vidya drink?  
(ii) What fraction of the total quantity of water did Pratap drink?



### 2.3.2 Multiplication of a Fraction by a Fraction

Farida had a 9 cm long strip of ribbon. She cut this strip into four equal parts. How did she do it? She folded the strip twice. What fraction of the total length will each part represent?

Each part will be  $\frac{9}{4}$  of the strip. She took one part and divided it in two equal parts by

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