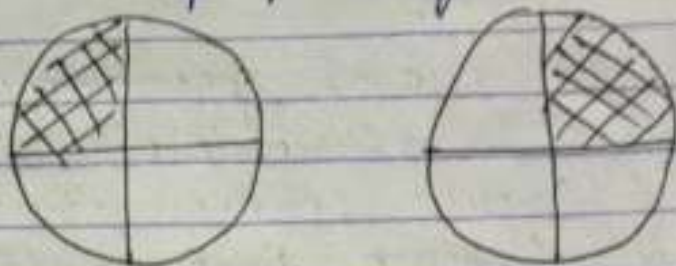


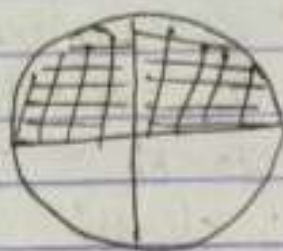
CHAPTER - FRACTIONS (PART-II)Multiplication of fractions by a whole number

Observe the picture below. Each shaded part is  $\frac{1}{4}$  part of a circle.

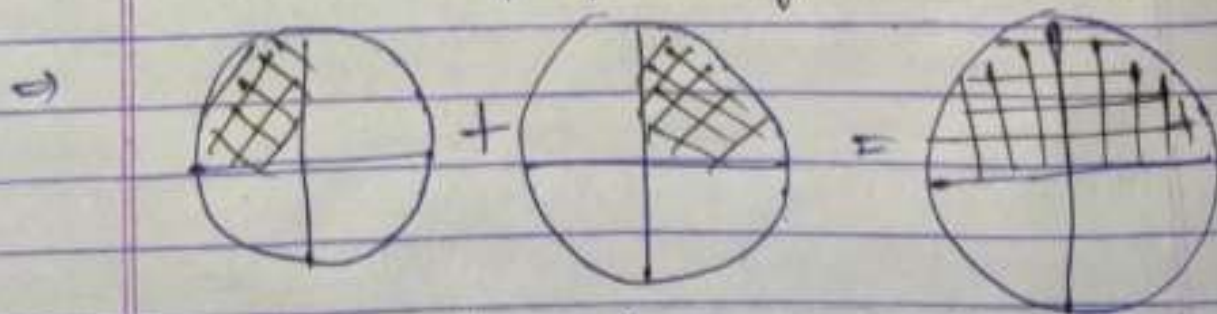


How much will the two shaded portions together represent? They will represent  $\frac{1}{4} + \frac{1}{4} = 2 \times \frac{1}{4}$ .

Combining the two shaded parts, we get



What part of a circle does the shaded part in fig. above represent? It represents  $\frac{2}{4}$  part of a circle.



$$\text{or } 2 \times \frac{1}{4} = \frac{2}{4}$$

for improper fraction, we have

$$2 \times \frac{5}{3} = \frac{2 \times 5}{3} = \frac{10}{3}$$

$$3 \times \frac{8}{7} = \frac{3 \times 8}{7} = \frac{24}{7}$$

# Thus, "to multiply a whole number with a proper or an improper fraction, we multiply the whole number with the numerator of the fraction, keeping the denominator same."

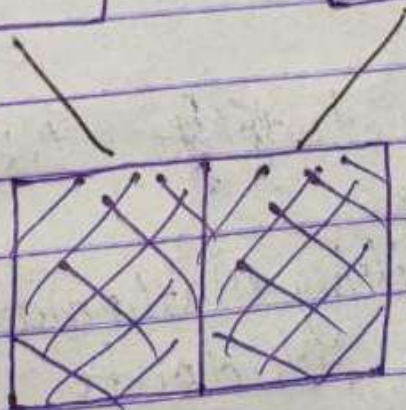
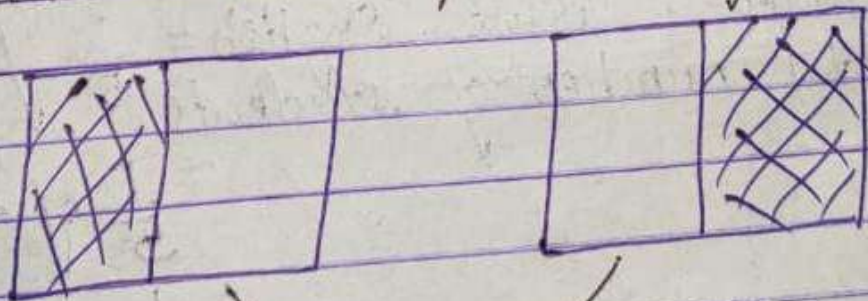
# To multiply a mixed fraction to a whole number, first convert the mixed fraction to an improper fraction and then multiply.

$$\therefore 3 \times 2\frac{5}{7} = 3 \times \frac{19}{7} = \frac{3 \times 19}{7} = \frac{57}{7}$$

$$= 8\frac{1}{7}$$

$$\text{Similarly, } 2 \times 4\frac{2}{5} = 2 \times \frac{22}{5} = \frac{44}{5} = 8\frac{4}{5}$$

fraction as an operator of



Observe these figures.

The two squares are exactly similar.  
Each shaded portion represents  $\frac{1}{2}$  of 1.

So, both the shaded portion 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 =  $\frac{1}{2} \times 2 = 1$ .

So, we see that 'of' represents multiplication.

Example

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.

(i)

Solution

How many students like to study 'Eng'?

Total number of students = 40  
Students liking English =  $\frac{1}{5}$  of the total number of students

$$= \frac{1}{5} \text{ of } 40$$

$$= \frac{1}{5} \times 40 = 8$$

(ii)

How many students like to study Mathematics.

Solution

Students liking Mathematics =  $\frac{2}{5}$  of total number of students

$$= \frac{2}{5} \text{ of } 40$$

$$= \frac{2}{5} \times \frac{8}{10} = \underline{\underline{\frac{16}{50}}}$$

(iii) What fraction of the total number of students like to study science?

Solution The number of students who like English and Mathematics =  $8 + 16 = 24$ .

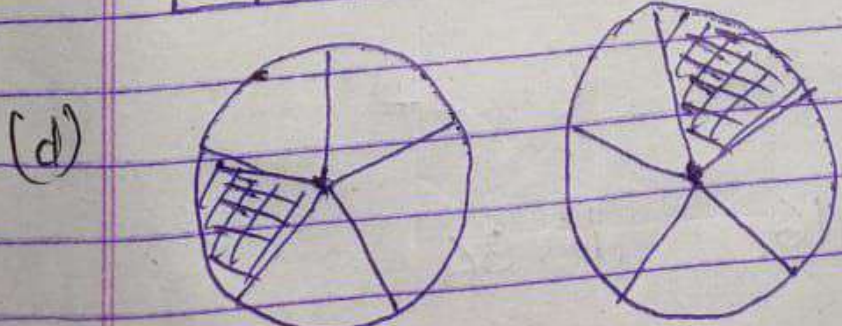
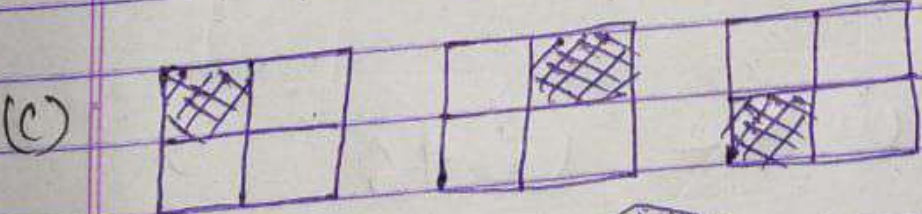
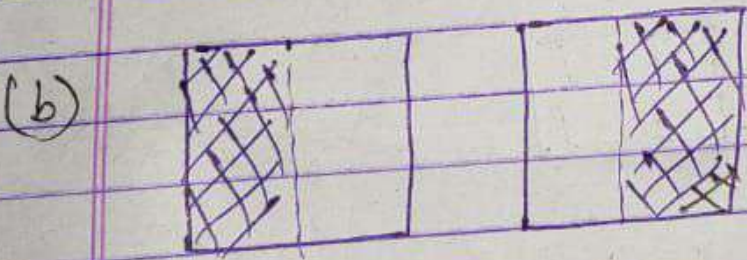
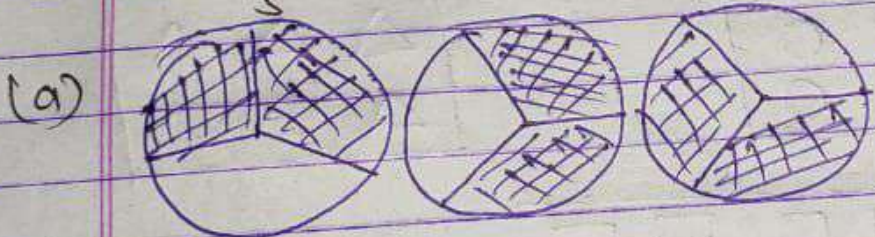
Thus, the number of students who like Science =  $40 - 24 = 16$ .

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

$$= \frac{2}{5}$$

EXERCISE

(i) 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)  $3 \times \frac{1}{4}$



2) Multiply and reduce to lowest form and convert into a mixed fraction.

(a)  $7 \times \frac{3}{5}$

(b)  $20 \times \frac{4}{5}$

(c)  $\frac{5}{2} \times 6$

(d)  $5 \times \frac{2}{9}$

(e)  $4 \times \frac{1}{3}$

(f)  $13 \times \frac{1}{3}$

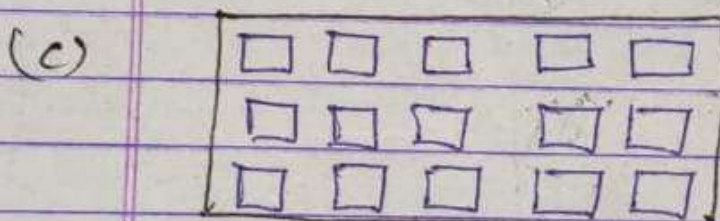
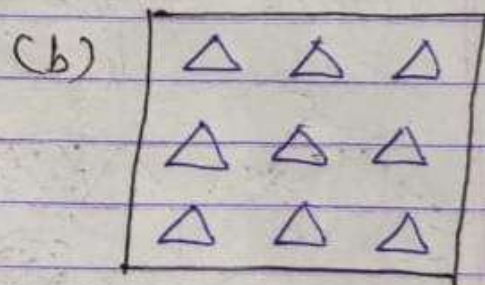
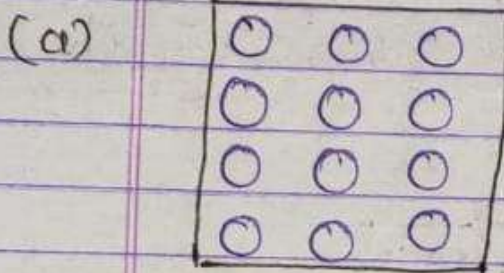
(g)  $11 \times \frac{4}{7}$

(h)  $\frac{2}{3} \times 4$

(i)  $2 \times \frac{6}{7}$

(j)  $15 \times \frac{3}{5}$

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)

4) 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

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⑥

Date \_\_\_\_\_  
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(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)  $3 \times 6\frac{1}{4}$

(c)  $4 \times 6\frac{1}{3}$

(d)  $7 \times 2\frac{1}{4}$

(e)  $5 \times 6\frac{3}{4}$

(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  $\frac{1}{5}$  the remaining water.

(i) How much did Vidya drink?

(ii) What fraction of the total quantity of water did Pratap drink.