Fractions— Multiplication and Division

Let's Recall ...

- To reduce a fraction to its lowest term, we cancel out the common factors from the numerator and the denominator.
- Multiplication is repeated addition.
- Division is repeated subtraction.

Multiplication of Fractions with Whole Numbers

The fraction $\frac{1}{4}$ can be represented as shown.

Now let's find out what $3 \times \frac{1}{4}$ is.

We know that multiplication is repeated addition. Thus,

$$3 \times \frac{1}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{1+1+1}{4} = \frac{3}{4} = \frac{3 \times 1}{4}$$

$$\frac{1}{4} \quad + \quad \frac{1}{4} \quad + \quad \frac{1}{4} \quad = \quad \frac{3}{4}$$

Thus to multiply a fraction by a whole number, we multiply the whole number by the numerator of the fraction and keep the denominator as it is.

Example 1: Multiply 7 by $\frac{4}{5}$.

Solution: $7 \times \frac{4}{5} = \frac{7 \times 4}{5} = \frac{28}{5}$ (improper fraction)

$$= 5\frac{3}{5} \text{ (mixed fraction)}$$

Remember

While multiplying a fraction with a whole number, always express your answer in the lowest term.

Fraction of a Whole Number

Example 2: What is $\frac{2}{3}$ of 6?

Solution: $\frac{2}{3}$ of $6 = \frac{2}{3} \times 6 = \frac{2 \times 6}{3} = \frac{12}{3} = 4$

So, $\frac{2}{3}$ of $6 = 4$.

Example 3: What is $\frac{3}{8}$ of 720 g?

Solution: $\frac{3}{8}$ of 720 g = $\frac{3}{8} \times 720 = \frac{3 \times \overset{90}{\cancel{720}}}{\underset{1}{\cancel{8}}} = 3 \times 90 = 270$

So, $\frac{3}{8}$ of 720 g = 270 g.

Example 4: What is $\frac{1}{5}$ of ₹ 20?

Solution: $\frac{1}{5}$ of ₹ 20 = $\frac{1}{5} \times 20 = \frac{1 \times 20}{5} = \frac{20}{5} = 4$

So, $\frac{1}{5}$ of ₹ 20 = ₹ 4.

EXERCISE 5.1

1. Multiply.

(a) $\frac{3}{5} \times 7$ (b) $\frac{2}{7} \times 4$ (c) $\frac{4}{9} \times 6$ (d) $\frac{7}{12} \times 8$ (e) $\frac{2}{5} \times 9$

(f) $\frac{1}{3} \times 5$ (g) $\frac{9}{20} \times 11$ (h) $\frac{5}{11} \times 3$ (i) $\frac{6}{24} \times 7$ (j) $\frac{7}{9} \times 2$

(k) $\frac{13}{30} \times 10$ (l) $\frac{1}{8} \times 14$ (m) $\frac{2}{15} \times 5$ (n) $\frac{13}{35} \times 5$ (o) $12 \times \frac{9}{30}$

2. Fill in the blanks.

(a) $\frac{4}{5}$ of ₹ 30 = ₹ _____

(b) $\frac{1}{8}$ of 400 g = _____ g

(c) $\frac{1}{4}$ of 5 kg = _____ kg

(d) $\frac{2}{3}$ of 9 km = _____ km

(e) $\frac{5}{6}$ of 8 km = _____ m

(f) $\frac{2}{9}$ of 27 L = _____ L

(g) $\frac{5}{8}$ of ₹ 21 = ₹ _____

(h) $\frac{3}{11}$ of 33 L = _____ mL

Multiplication of Two Fractions

Follow these steps to multiply two fractions.

Step 1: Multiply the numerators of the two fractions and write as the numerator of the product.

Step 2: Multiply the denominators of the two fractions and write as the denominator of the product.

Step 3: Simplify or reduce the fraction to the lowest term if required. In case of an improper fraction, change to mixed fraction.

Example 5: Multiply $\frac{2}{7}$ by $\frac{3}{5}$.

Solution: $\frac{2}{7} \times \frac{3}{5} = \frac{2 \times 3}{7 \times 5} = \frac{6}{35}$

Example 6: Multiply $\frac{9}{11}$ by $\frac{7}{18}$.

Solution: $\frac{9}{11} \times \frac{7}{18} = \frac{\overset{1}{\cancel{9}} \times 7}{11 \times \underset{2}{\cancel{18}}} = \frac{1 \times 7}{11 \times 2} = \frac{7}{22}$

Multiplication of More Than Two Fractions

We multiply more than two fractions in the same way as we multiply two fractions, i.e., we multiply the numerators together and the denominators together.

Example 7: Multiply $\frac{2}{3}$, $\frac{5}{6}$ and $\frac{7}{11}$.

Solution: $\frac{2}{3} \times \frac{5}{6} \times \frac{7}{11} = \frac{\overset{1}{\cancel{2}} \times 5 \times 7}{3 \times \underset{3}{\cancel{6}} \times 11} = \frac{1 \times 5 \times 7}{3 \times 3 \times 11} = \frac{35}{99}$

> **Quick Tip**
>
> Cancel out the common factors before actually finding the product.

Example 8: Find the product of $\frac{3}{4} \times \frac{8}{9} \times \frac{2}{5} \times \frac{15}{22}$.

Solution: $\frac{3}{4} \times \frac{8}{9} \times \frac{2}{5} \times \frac{15}{22} = \frac{\overset{1}{\cancel{3}} \times \overset{2}{\cancel{8}} \times \overset{1}{\cancel{2}} \times \overset{3}{\cancel{15}}}{\underset{1}{\cancel{4}} \times \underset{3}{\cancel{9}} \times \underset{1}{\cancel{5}} \times \underset{11}{\cancel{22}}} = \frac{1 \times 2 \times 1 \times \overset{1}{\cancel{3}}}{1 \times \cancel{3} \times 1 \times 11}$

$= \frac{1 \times 2 \times 1 \times 1}{1 \times 1 \times 1 \times 11} = \frac{2}{11}$

Multiplication of Mixed Fractions

To multiply a mixed fraction by a whole number, convert the mixed fraction to improper fraction and then multiply. Then convert the answer back to a mixed fraction. Simplify first, if required.

Example 9: Multiply $1\frac{5}{8}$ by 3.

Solution: $1\frac{5}{8} = \frac{(1 \times 8) + 5}{8} = \frac{8 + 5}{8} = \frac{13}{8}$

$1\frac{5}{8} \times 3 = \frac{13}{8} \times 3 = \frac{13}{8} \times \frac{3}{1} = \frac{13 \times 3}{8 \times 1} = \frac{39}{8} = 4\frac{7}{8}$

Example 10: Multiply $2\frac{4}{7}$ by 5.

Solution: $2\frac{4}{7} = \frac{(2 \times 7) + 4}{7} = \frac{14 + 4}{7} = \frac{18}{7}$

$2\frac{4}{7} \times 5 = \frac{18}{7} \times 5 = \frac{18}{7} \times \frac{5}{1} = \frac{18 \times 5}{7 \times 1} = \frac{90}{7} = 12\frac{6}{7}$

Example 11: Multiply $1\frac{3}{5}$ by $2\frac{1}{2}$.

Solution:

$$1\frac{3}{5} \times 2\frac{1}{2} = \frac{(1 \times 5) + 3}{5} \times \frac{(2 \times 2) + 1}{2}$$

$$= \frac{(5 + 3)}{5} \times \frac{(4 + 1)}{2} = \frac{\overset{4}{\cancel{8}}}{\underset{1}{\cancel{5}}} \times \frac{\overset{1}{\cancel{5}}}{\underset{1}{\cancel{2}}} = \frac{4 \times 1}{1 \times 1} = \frac{4}{1} = 4$$

Example 12: Multiply $3\frac{1}{4}$ by $\frac{6}{11}$.

Solution:

$$3\frac{1}{4} \times \frac{6}{11} = \frac{(3 \times 4) + 1}{4} \times \frac{6}{11}$$

$$= \frac{(12 + 1)}{4} \times \frac{6}{11} = \frac{13}{\underset{2}{\cancel{4}}} \times \frac{\overset{3}{\cancel{6}}}{11}$$

$$= \frac{13 \times 3}{2 \times 11} = \frac{39}{22} = 1\frac{17}{22}$$

Maths Fun

Archana's mother baked 7 pastries. She gave half of what she made plus a pastry to her friend Payal. She then gave half of what was left plus half a pastry to another friend Sonam. Then, she kept what was left for Archana. How many pastries did each person get?

Properties of multiplication of fractions

1. Two fractions can be multiplied in any order. For example, $\frac{3}{7} \times \frac{4}{5} = \frac{4}{5} \times \frac{3}{7}$

2. Three fractions can be multiplied by grouping them in any order.

   For example, $\frac{2}{3} \times \left(\frac{1}{9} \times \frac{4}{7} \right) = \left(\frac{2}{3} \times \frac{1}{9} \right) \times \frac{4}{7}$

3. A fraction when multiplied by zero results in zero. For example, $\frac{8}{13} \times 0 = 0 \times \frac{8}{13} = 0$

4. A fraction when multiplied by 1 gives the same fraction.

   For example, $\frac{3}{5} \times 1 = 1 \times \frac{3}{5} = \frac{3}{5}$

EXERCISE 5.2

1. Find the product.

   (a) $\frac{4}{9} \times \frac{3}{8}$ (b) $\frac{2}{3} \times \frac{4}{5}$ (c) $\frac{3}{7} \times \frac{6}{11}$ (d) $\frac{5}{9} \times \frac{12}{15}$ (e) $\frac{11}{12} \times \frac{8}{13}$

   (f) $\frac{9}{16} \times \frac{2}{7}$ (g) $\frac{11}{15} \times \frac{5}{22}$ (h) $\frac{6}{21} \times 3$ (i) $\frac{6}{24} \times \frac{32}{18}$ (j) $\frac{7}{36} \times \frac{9}{28}$

2. Multiply the following fractions.

   (a) $\frac{2}{4} \times \frac{2}{7} \times \frac{5}{9}$ (b) $\frac{5}{12} \times \frac{3}{7} \times \frac{1}{6} \times \frac{2}{3}$ (c) $\frac{7}{9} \times \frac{8}{11} \times \frac{3}{4}$

   (d) $\frac{6}{13} \times \frac{26}{42} \times \frac{5}{9}$ (e) $\frac{11}{15} \times \frac{30}{33} \times \frac{6}{7} \times \frac{4}{30}$ (f) $\frac{8}{14} \times \frac{8}{16} \times \frac{5}{9}$

3. Multiply the given numbers.

(a) $1\frac{5}{7} \times 3$ (b) $2\frac{3}{5} \times 2$ (c) $3\frac{1}{2} \times 5$ (d) $2\frac{1}{4} \times 1\frac{3}{5}$ (e) $\frac{18}{5} \times \frac{15}{14}$

(f) $4\frac{1}{5} \times \frac{5}{9}$ (g) $\frac{6}{11} \times \frac{55}{18}$ (h) $7 \times \frac{4}{35}$ (i) $6\frac{3}{5} \times 2\frac{5}{3}$ (j) $\frac{28}{27} \times 2\frac{1}{4}$

4. Fill in the blanks.

(a) $\frac{51}{64} \times 0 = $ _____

(b) $\frac{8}{5} \times \frac{3}{7} = $ _____ $\times \frac{8}{5}$

(c) $\frac{2}{7} \times \left(\rule{1cm}{0.4pt} \times \frac{5}{8} \right) = \left(\frac{2}{7} \times \frac{1}{3} \right) \times \frac{5}{8}$ (d) $1 \times \frac{75}{93} = $ _____

(e) _____ $\times \frac{9}{11} = \frac{9}{11} \times \frac{6}{13}$ (f) _____ $\times \frac{98}{101} = \frac{98}{101} \times \frac{5}{7}$

Reciprocal of a Fraction

Reciprocal of a fraction means inverting the given fraction, i.e., changing the numerator to the denominator and the denominator to the numerator. It is also called the multiplicative inverse of a fraction.

For example, reciprocal of $\frac{5 \text{ (Numerator)}}{7 \text{ (Denominator)}} = \frac{7 \text{ (Numerator)}}{5 \text{ (Denominator)}}$

Similarly, reciprocal of $\frac{16}{23} = \frac{23}{16}$.

The reciprocal of a whole number is 1 divided by the whole number.

Remember

The product of a number and its reciprocal is always 1.

For example, $\frac{4}{5} \times \frac{5}{4} = 1$.

For example, reciprocal of $5 = \frac{1}{5}$

A mixed number is changed to an improper fraction before finding its reciprocal.
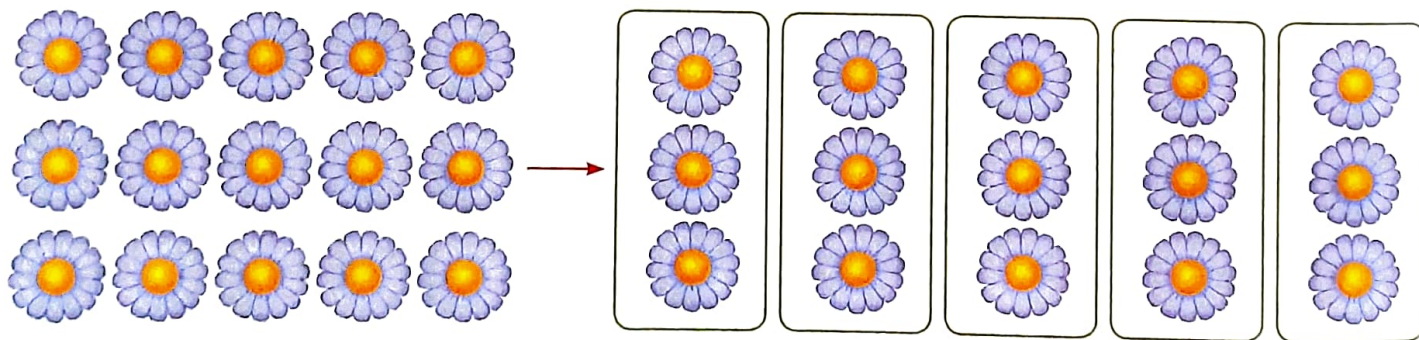
For example, $2\frac{1}{3} = \frac{7}{3}$ and its reciprocal is $\frac{3}{7}$.

Division of Fractions

Division of a whole number by a fraction

To divide 15 by 3, we find how many 3s are there in 15.

$15 \div 3 = 5$, as there are five 3s in 15.

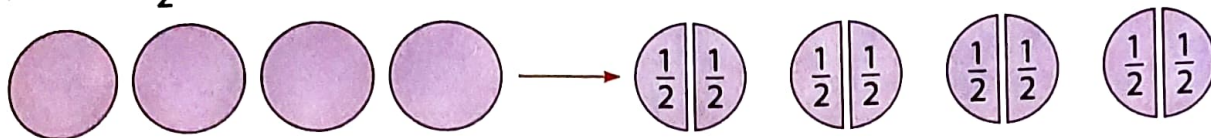Similarly, we divide a whole number by a fraction.

To divide 4 by $\frac{1}{2}$, we find how many halves are there in 4.
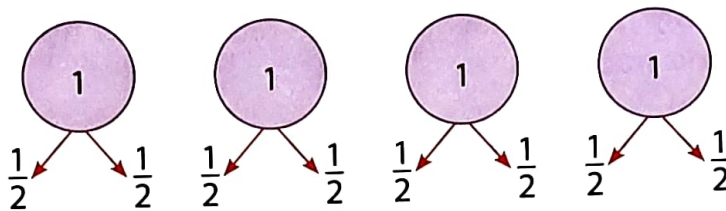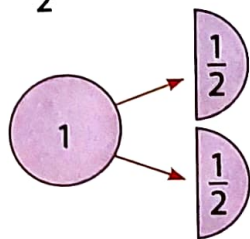

So, there are 8 halves in 4.

Thus, $4 \div \frac{1}{2} = 8$

We can also say that as there are 2 halves in 1 whole, there are $4 \times 2 = 8$ halves in 4 wholes.

Thus, $4 \div \frac{1}{2}$ is same as 4×2.

> **Remember**
>
> Whole number ÷ Fraction = Whole number × Reciprocal of fraction

To divide a whole number by a fraction:

(i) change the sign of division to multiplication.

(ii) multiply the given whole number by the reciprocal of the fraction.

Example 13: Divide 16 by $\frac{1}{4}$.

Solution: $16 \div \frac{1}{4} = 16 \times 4 = 64$

Example 14: Divide 20 by $\frac{4}{5}$.

Solution: $20 \div \frac{4}{5} = \overset{5}{\cancel{20}} \times \frac{5}{\underset{1}{\cancel{4}}}$

$= 5 \times 5 = 25$

Division of a fraction by a whole number

To divide a fraction by a whole number:

(i) change the sign of division to multiplication.

(ii) multiply the given fraction by the reciprocal of the whole number.

Example 15: Divide $\frac{4}{7}$ by 5.

Solution: $\frac{4}{7} \div 5 = \frac{4}{7} \div \frac{5}{1}$

$= \frac{4}{7} \times \frac{1}{5}$ (∵ Reciprocal of 5 is $\frac{1}{5}$)

$= \frac{4 \times 1}{7 \times 5} = \frac{4}{35}$

> **Remember**
>
> Fraction ÷ Whole number = Fraction × $\frac{1}{\text{Whole number}}$

Example 16: Divide $3\frac{4}{7}$ by 15.

Solution: $3\frac{4}{7} \div 15 = \frac{(3 \times 7) + 4}{7} \div \frac{15}{1} = \frac{21 + 4}{7} \div \frac{15}{1}$

$$= \frac{\overset{5}{\cancel{25}}}{7} \times \frac{1}{\underset{3}{\cancel{15}}} = \frac{5 \times 1}{7 \times 3} = \frac{5}{21}$$

Division of a fraction by another fraction

To divide a fraction by another fraction:

(i) change the sign of division to multiplication.

(ii) multiply the first fraction by the reciprocal of the second fraction.

Remember

First fraction ÷ Second fraction = First fraction × Reciprocal of second fraction

Example 17: Divide $\frac{3}{8}$ by $\frac{9}{4}$.

Solution: $\frac{3}{8} \div \frac{9}{4} = \frac{3}{8} \times \frac{4}{9} = \frac{\overset{1}{\cancel{3}} \times \overset{1}{\cancel{4}}}{\underset{2}{\cancel{8}} \times \underset{3}{\cancel{9}}} = \frac{1 \times 1}{2 \times 3} = \frac{1}{6}$

Example 18: Divide $3\frac{2}{9}$ by $\frac{14}{27}$.

Solution: $3\frac{2}{9} \div \frac{14}{27} = \frac{(3 \times 9) + 2}{9} \div \frac{14}{27} = \frac{27 + 2}{9} \div \frac{14}{27} = \frac{29}{9} \div \frac{14}{27}$

$$= \frac{29}{9} \times \frac{27}{14} = \frac{29 \times \overset{3}{\cancel{27}}}{\underset{1}{\cancel{9}} \times 14} = \frac{29 \times 3}{1 \times 14} = \frac{87}{14} = 6\frac{3}{14}$$

Properties of division of fractions

1. Two fractions cannot be divided in any order. For example, $\frac{2}{3} \div \frac{4}{5} \neq \frac{4}{5} \div \frac{2}{3}$

$$\frac{2}{3} \div \frac{4}{5} = \frac{2}{3} \times \frac{5}{4} = \frac{\overset{1}{\cancel{2}} \times 5}{3 \times \underset{2}{\cancel{4}}} = \frac{1 \times 5}{3 \times 2} = \frac{5}{6}$$

$$\frac{4}{5} \div \frac{2}{3} = \frac{4}{5} \times \frac{3}{2} = \frac{\overset{2}{\cancel{4}} \times 3}{5 \times \underset{1}{\cancel{2}}} = \frac{2 \times 3}{5 \times 1} = \frac{6}{5}$$

Since $\frac{5}{6} \neq \frac{6}{5}$, $\frac{2}{3} \div \frac{4}{5} \neq \frac{4}{5} \div \frac{2}{3}$.

2. When a fraction is divided by itself, the result is 1.

For example, $\frac{6}{7} \div \frac{6}{7} = \frac{6}{7} \times \frac{7}{6} = \frac{\overset{1}{\cancel{6}} \times \overset{1}{\cancel{7}}}{\underset{1}{\cancel{7}} \times \underset{1}{\cancel{6}}} = \frac{1 \times 1}{1 \times 1} = 1$

3. When 0 is divided by a fraction, the result is 0.

   For example, $0 \div \dfrac{8}{11} = 0 \times \dfrac{11}{8} = 0$

4. A fraction cannot be divided by 0 as divisibility by 0 is not defined.

   For example, $\dfrac{3}{5} \div 0$ is not defined.

5. When a fraction is divided by 1, the result is the fraction itself.

   For example, $\dfrac{15}{23} \div 1 = \dfrac{15}{23} \div \dfrac{1}{1} = \dfrac{15}{23} \times \dfrac{1}{1} = \dfrac{15 \times 1}{23 \times 1} = \dfrac{15}{23}$

EXERCISE 5.3

1. Find the reciprocal of the following numbers.

   (a) $\dfrac{3}{11}$

   (b) $\dfrac{2}{5}$

   (c) $\dfrac{3}{16}$

   (d) $\dfrac{9}{15}$

   (e) 14

   (f) 20

   (g) $\dfrac{12}{17}$

   (h) 1

   (i) $\dfrac{27}{43}$

   (j) $\dfrac{82}{57}$

   (k) $\dfrac{108}{75}$

   (l) $\dfrac{81}{54}$

   (m) $\dfrac{72}{103}$

   (n) $\dfrac{15}{19}$

   (o) $\dfrac{99}{134}$

2. Find the solution.

   (a) $7 \div \dfrac{1}{3}$

   (b) $22 \div \dfrac{2}{5}$

   (c) $13 \div \dfrac{3}{5}$

   (d) $30 \div \dfrac{3}{10}$

   (e) $32 \div 2\dfrac{1}{3}$

   (f) $\dfrac{6}{7} \div 3$

   (g) $\dfrac{5}{11} \div 2$

   (h) $\dfrac{4}{9} \div 5$

   (i) $\dfrac{8}{15} \div 4$

   (j) $\dfrac{24}{15} \div 8$

   (k) $\dfrac{13}{7} \div 2$

   (l) $\dfrac{13}{10} \div 6$

   (m) $3\dfrac{6}{11} \div 13$

   (n) $4\dfrac{3}{8} \div 2\dfrac{1}{4}$

   (o) $25 \div 3\dfrac{1}{5}$

3. Divide the following fractions.

   (a) $\dfrac{2}{7} \div \dfrac{8}{21}$

   (b) $\dfrac{6}{11} \div \dfrac{14}{22}$

   (c) $\dfrac{7}{9} \div \dfrac{1}{3}$

   (d) $\dfrac{26}{25} \div \dfrac{8}{15}$

   (e) $3\dfrac{1}{8} \div \dfrac{20}{18}$

   (f) $5\dfrac{1}{4} \div \dfrac{3}{16}$

   (g) $4\dfrac{5}{9} \div 2\dfrac{4}{27}$

   (h) $7\dfrac{1}{3} \div 4\dfrac{8}{9}$

   (i) $\dfrac{48}{35} \div \dfrac{16}{25}$

   (j) $\dfrac{72}{39} \div \dfrac{18}{13}$

4. Fill in the blanks.

   (a) $\dfrac{5}{7} \div \dfrac{5}{7} =$ _____

   (b) $\dfrac{8}{11} \div 1 =$ _____

   (c) $0 \div \dfrac{13}{15} =$ _____

   (d) $\dfrac{9}{20} \div 0 =$ _____

   (e) $\dfrac{11}{15} \div \dfrac{11}{15} =$ _____

   (f) $\dfrac{16}{21} \div 1 =$ _____

Word Problems

Example 19: At Pradeep Gaming Station, $\dfrac{1}{2}$ of the games are racing games. Among these racing games, $\dfrac{2}{5}$ are car racing games. What fraction of games at Pradeep Gaming Station are car racing games?

Solution: Fraction of racing games $= \dfrac{1}{2}$

Car racing games out of these $= \dfrac{2}{5}$

Fraction of car racing games $= \dfrac{2}{5}$ of $\dfrac{1}{2}$

$$= \dfrac{2}{5} \times \dfrac{1}{2} = \dfrac{\overset{1}{\cancel{2}} \times 1}{5 \times \underset{1}{\cancel{2}}} = \dfrac{1 \times 1}{5 \times 1} = \dfrac{1}{5}$$

So, $\dfrac{1}{5}$ of all games are car racing games.

Example 20: A carpenter used $\dfrac{2}{5}$ of a can of paint to paint 2 tables. He used the same amoun of paint for each table. How many cans of paint did he use for each table?

Solution: Number of cans used to paint 2 tables $= \dfrac{2}{5}$

Number of cans used to paint 1 table $= \dfrac{2}{5} \div 2 = \dfrac{2}{5} \div \dfrac{2}{1}$

$$= \dfrac{2}{5} \times \dfrac{1}{2} = \dfrac{\overset{1}{\cancel{2}} \times 1}{5 \times \underset{1}{\cancel{2}}} = \dfrac{1 \times 1}{5 \times 1} = \dfrac{1}{5}$$

So, $\dfrac{1}{5}$ of a can was used to paint each table.

EXERCISE 5.4

1. In Varun's music class, $\dfrac{1}{2}$ of the students play instruments. Out of these, $\dfrac{1}{2}$ play string instruments. What fraction of students play string instruments?

2. Last week, Tanu spent $4\dfrac{2}{3}$ hours doing her homework. Shreya spent 2 times as many hours doing her homework as Tanu did. How many hours did Shreya spend on doing her homework?

3. Each cement block weighs $2\dfrac{1}{5}$ kg. How much do 5 such cement blocks weigh?

4. A biscuit factory used $\dfrac{1}{4}$ of a barrel of oatmeal in each batch of cookies. If the factory used $\dfrac{1}{2}$ of a barrel of oatmeal one day, how many batches of cookies did factory make?

5. At the end of the night, a bakery had $\dfrac{1}{4}$ of a cake left. Two employees of the bakery took home equal amount of the leftover cake. How much cake did each employee take home?

6. Rahul walked $5\dfrac{3}{4}$ km in $2\dfrac{1}{2}$ hours. How much distance did Rahul walk in 1 hour?

7. If Honey bought $3\dfrac{1}{2}$ kg of apples for ₹ 280, then what is the cost of 1 kg apples?

1. Find the product.

   (a) $\frac{6}{15} \times 9$

   (b) $\frac{4}{11} \times \frac{22}{16}$

   (c) $3\frac{5}{7} \times 3\frac{1}{6}$

   (d) $\frac{3}{5} \times \frac{10}{9} \times \frac{2}{7}$

   (e) $3\frac{2}{5} \times 1\frac{4}{9} \times 15$

2. Find the solution.

   (a) $\frac{12}{25} \div 6$

   (b) $\frac{7}{8} \div \frac{14}{32}$

   (c) $4\frac{3}{5} \div 3\frac{1}{15}$

   (d) $10\frac{8}{7} \div \frac{28}{63}$

   (e) $\frac{64}{33} \div \frac{32}{55}$

3. Write True or False.

   (a) $\frac{4}{9} \times 1 = \frac{4}{9}$ ☐

   (b) $0 \times \frac{3}{2} = \frac{3}{2}$ ☐

   (c) $\frac{6}{7} \times \frac{2}{5} = \frac{2}{5} \times \frac{6}{7}$ ☐

   (d) $\frac{7}{11} \div 1 = \frac{7}{11}$ ☐

   (e) $0 \div \frac{21}{54} = 0$ ☐

   (f) $\frac{13}{18} \div \frac{13}{18} = 0$ ☐

4. If product of two numbers is $6\frac{5}{9}$ and one of the numbers is $4\frac{2}{9}$, what is the other number?

5. On Saturday night, Devesh made a pizza for dinner. He kept $\frac{1}{6}$ of the pizza and ate the rest. On Sunday, he ate $\frac{1}{3}$ of what was left. How much pizza did Devesh eat on Sunday?
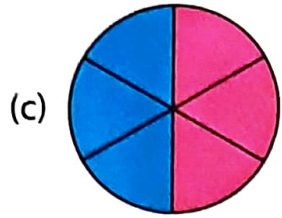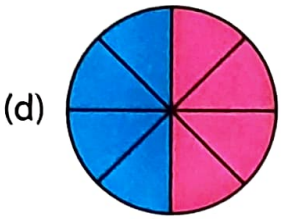
SOME NCERT TEXTBOOK QUESTIONS

1. Complete these

   (a)
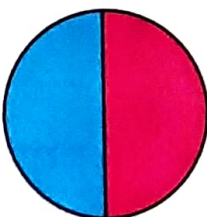
   This circle is divided into two equal parts. Out of _____ equal parts one part is coloured blue.
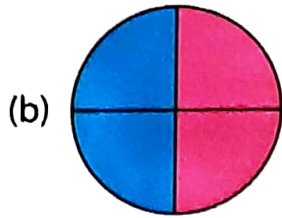
(b) Here the circle is divided into _____ equal parts. Out of _____ equal parts, _____ parts are coloured blue.

(c) Here the circle is _____

_____

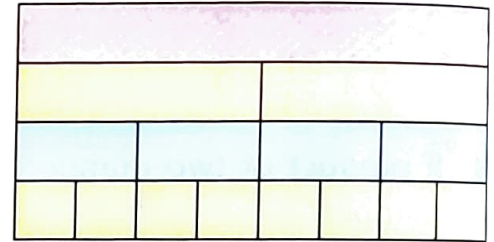(d) Here the circle is _____

_____

So we can say that $\dfrac{1}{2} = \dfrac{2}{...} = \dfrac{...}{6} = \dfrac{...}{8}$

2. Look at the picture. Write what part of the strip is each green piece. Write the part of a piece of each colour.
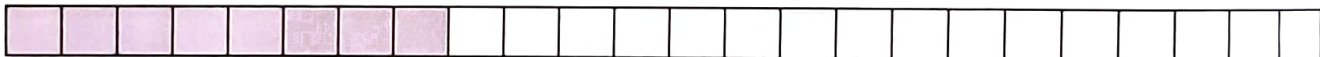
   (i) How many one-fourths will make a half?

   (ii) How many $\dfrac{1}{8}$ will make $\dfrac{1}{4}$?

   (iii) How many $\dfrac{1}{8}$ are in $\dfrac{1}{2}$?

   Now ask your friends some questions on the same picture.

3. Arun sleeps at 10 p.m. and wakes up at 6 a.m. He plays from 7 a.m. to 8 a.m. and again from 4 p.m. to 6 p.m.

   Sleeping: One-third of a day

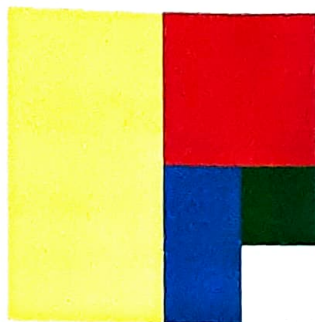   Use different colours to show

   Playing: One eighth of a day

   Studying: $\dfrac{1}{4}$ of a day

   How many hours does Arun take for

   Sleeping? ⬚ hours   Studying? ⬚ hours   Playing? ⬚ hours

   What part of the day does he use for other activities?

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4. Look at this square.
   (i) What part is coloured blue?
   (ii) What part is green?

5. Ammini says half of half and one-third of three-quarters are equal. Do you agree? How will you show this?

1. Astha had $\frac{1}{3}$ of a bowl of grapes. She let her friend Sandy eat $\frac{2}{3}$ of her grapes. What fraction of grapes did Sandy eat? Are grapes nutritious? What all things can you make from grapes?

2. The cost of 1 kg of sugar is ₹ 32. What is the cost of $4\frac{3}{8}$ kg of sugar? Why is high consumption of sugar harmful for health?

1. Simplify the following.

   (a) $\frac{7}{12} \div \frac{21}{18} \div \frac{4}{9}$

   (b) $\frac{6}{15} \times \frac{20}{32} \div \frac{35}{8} \times \frac{7}{10} \div 9$

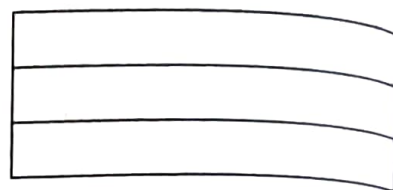2. Find the number which when divided by $2\frac{6}{11}$ gives the result as $1\frac{5}{22}$.

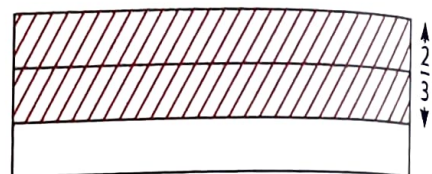To understand multiplication of two fractions
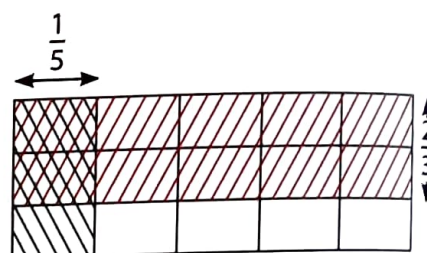
Things We Need: Crayons

How To Do:

1. Let's see how to find $\frac{2}{3} \times \frac{1}{5}$.

2. Draw a rectangle. Divide it into 3 equal parts by drawing horizontal lines.

3. Shade 2 horizontal strips to represent $\frac{2}{3}$.

4. Further divide the rectangle into 5 equal parts by drawing vertical lines.

5. Shade 1 vertical strip by a different colour to represent $\frac{1}{5}$.

6. The double shaded small rectangles represent the product.

   Number of double shaded small rectangles = 2

   Total number of small rectangles = 15

   Double shaded small rectangles represent $\frac{2}{15}$.

   So, $\frac{2}{3} \times \frac{1}{5} = \frac{2}{15}$.

   Now, find $\frac{3}{4} \times \frac{1}{2}$ by shading the adjoining rectangle.