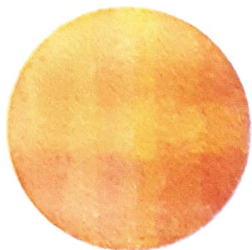


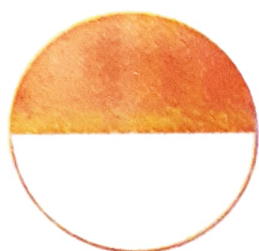


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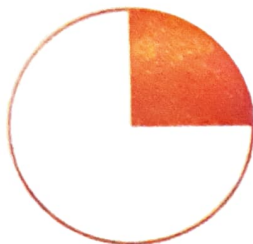
Let's learn division of fractions -



One or whole = 1



Half part = $1 \div 2 = 1 \times \frac{1}{2} = \frac{1}{2}$



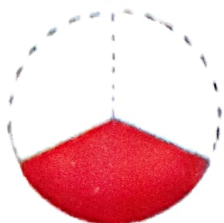
Half of the half part = $\frac{1}{2} \div 2 = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

We see that for dividing fractions, we multiply it with the reciprocal of divisor.

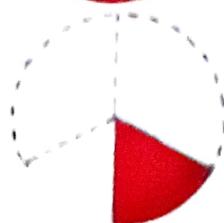
Look at it again -



One or whole = 1



One third part = $1 \div 3 = 1 \times \frac{1}{3} = \frac{1}{3}$



Half part of the one third part = $\frac{1}{3} \div 2 = \frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$

Let's see this too -

If $\frac{4}{5}$ is divided by 6 -

$$\begin{aligned} \frac{4}{5} \div 6 &= \frac{4}{5} \times \frac{1}{6} & \left(\frac{4}{5} \text{ is multiplied by the reciprocal of 6 i.e. } \frac{1}{6} \right) \\ &= \frac{2\cancel{4} \times 1}{5 \times \cancel{6}3} = \frac{2}{15} \end{aligned}$$

Word Problem

David gave the half part of a sugarcane to his brother. He distributed equally the remaining half part among his 4 friends. How much part of the sugarcane did each friend of David get?

Let's look at it this way too -



part left with David



$$\left| \text{---} \frac{1}{2} \text{---} \right|$$

remaining part left with David's brother



$$\left| \text{---} \frac{1}{2} \text{---} \right|$$

Part left with David = $1 \div 2$

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

Now David's friends got - $\frac{1}{2} \div 4$



$$\frac{1}{2} \div 4 = \frac{1}{2} \times \frac{1}{4} = \frac{1 \times 1}{2 \times 4} = \frac{1}{8} \text{ part}$$

Hence, David's each friend got $\frac{1}{8}$ part of sugarcane. 





Do it yourself -

1. Divide —

● $\frac{3}{5}$ by 4

● $\frac{6}{7}$ by 3

● $\frac{8}{13}$ by 6

2. Solve —

● $\frac{6}{9} \div 2$

● $\frac{7}{15} \div 3$

● $\frac{4}{9} \div 2$

● $2\frac{5}{8} \div 3$

● $5\frac{2}{7} \div 4$

● $3\frac{4}{9} \div 3$

3. $12\frac{1}{2}$ metres of cloth is needed for making 5 shirts. Cloth needed for making 1 shirt will be-

● 2 metres

● $2\frac{1}{2}$ metres

● $60\frac{1}{2}$ metres

● $1\frac{1}{4}$ metres

Division of a fraction by a fraction-

Let's solve-

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

We can also solve it like this —

$$\begin{aligned} \frac{3}{4} \div \frac{1}{4} &= \text{multiplication by 4 in } \frac{3}{4} \\ &= \frac{3}{\cancel{4}^1} \times \cancel{4}_1 = 3 \end{aligned}$$

Here, for division we multiply by the reciprocal of $\frac{1}{4}$ i.e. 4.

Hence, if a fraction is to be divided by another fraction, we multiply the first fraction by the reciprocal of the second fraction.

Example 1 : Solve $6\frac{1}{5} \div 3\frac{3}{4}$

Look :

$$\begin{aligned}
 6\frac{1}{5} \div 3\frac{3}{4} &= \frac{31}{5} \div \frac{15}{4} \\
 &= \frac{31}{5} \times \frac{4}{15} \\
 &= \frac{124}{75} \\
 &= 1\frac{49}{75}
 \end{aligned}$$

To divide a fraction, we multiply by $\frac{4}{15}$ which is the reciprocal of $\frac{15}{4}$.



Do it yourself -

1. **Solve—**

• $\frac{2}{3} \div \frac{2}{3}$

• $7\frac{1}{5} \div 3\frac{1}{5}$

• $18\frac{3}{4} \div 6\frac{3}{5}$

Division of a whole number by a fraction-

Look : Anuradha had a ribbon. She cut it into some pieces of equal length. If each part is $\frac{1}{4}$ of the whole ribbon, how many pieces did Anuradha make ?

Solution —

$$\begin{aligned}
 &1 \div \frac{1}{4} \\
 &= 1 \times \frac{4}{1} \\
 &= 4
 \end{aligned}$$



- Take three papers of the same size and divide each paper into two equal parts.
In all how many pieces are formed ?

Total 6 pieces are formed.

Look how —

Solution — $3 \div \frac{1}{2}$

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

$$= \frac{6}{1} = 6 \text{ pieces}$$

Example : What will be the quotient when 8 is divided by $\frac{1}{6}$?

Look : $8 \div \frac{1}{6}$

$$= 8 \times \frac{6}{1}$$

$$= 48$$

Hence, quotient will be 48.



Do it yourself-

1. Divide —

- 12 by $\frac{3}{4}$

- 15 by $2\frac{1}{2}$

2. Find the value —

- $15 \div \frac{5}{2}$

- $22 \div \frac{11}{2}$

- $24 \div \frac{3}{4}$

Word Problem-

Example 1 : Savita needs $\frac{3}{4}$ metre long piece of a ribbon. If she has a ribbon of 18 metres, how many pieces will she get ?

Look : Total length of the ribbon is 18 metres. Length of one piece is $\frac{3}{4}$ metre.

$$\begin{aligned}\text{Hence, number of pieces cut from the ribbon} &= 18 \div \frac{3}{4} = 18 \times \frac{4}{3} \\ &= 24\end{aligned}$$

Hence, there will be 24 pieces of the ribbon.

We have learnt

- To divide a fraction by a whole number except zero means dividing the fraction into equal parts of that whole number.
- To divide a fraction by a whole number except zero we multiply the fraction by the reciprocal of that whole number.
- To divide a fraction by another fraction the first fraction is multiplied by the reciprocal of the second fraction.

Exercise



1. Divide –

(a) $\frac{7}{8}$ by 2

(b) $\frac{3}{8}$ by $\frac{3}{4}$

(c) $24\frac{5}{9}$ by $8\frac{3}{9}$

2. Anju divided a muskmelon into two equal parts. She gave one part of muskmelon to Mahima. Mahima divided it into 6 equal parts and gave one part to Sunil. What part of muskmelon did Sunil get ?

3. Put the appropriate mark (✓ or ✕) in the box–

(a) $9\frac{1}{2} \div 3 = 3\frac{1}{6}$ ☐

(b) $6\frac{1}{2} \div 2 = 3\frac{1}{2}$ ☐

(c) $\frac{4}{5} \div 4 = \frac{2}{5}$ ☐

(d) $7\frac{3}{9} \div 2\frac{1}{9} = \frac{63}{9}$ ☐

4. Manohar distributed $\frac{3}{4}$ kg of sweets equally among three children. How many kilograms of sweets did each child get?

5. A rope of $\frac{8}{5}$ metre length was divided into four equal parts. Find the length of each part ?

