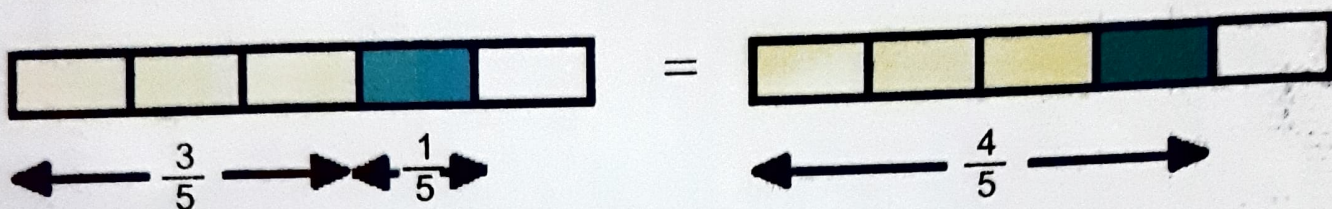
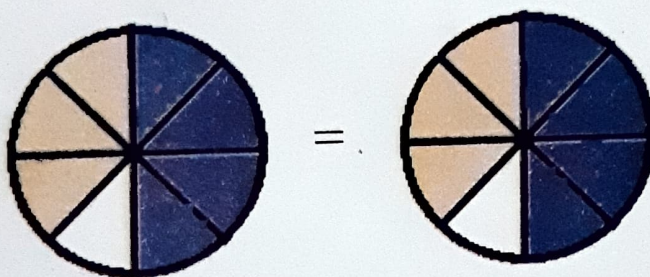


We know that -



It is solved in this way - $\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$

Similarly -



$$\frac{3}{8} + \frac{4}{8} = \frac{7}{8}$$

Hence, it is clear that -

The sum of the **fractions** with the same denominator = $\frac{\text{The sum of the numerators of fractions}}{\text{same denominator of fractions}}$

Example -

A sugarcane is divided into eight equal parts. Meena ate $\frac{1}{8}$ part of the sugarcane,

Rahul ate $\frac{5}{8}$ part of it. How much sugarcane did both of them eat together?

Solution: Part of the sugarcane Meena ate = $\frac{1}{8}$

Part of the sugarcane Rahul ate = $\frac{5}{8}$

$$\begin{aligned} \text{Total part of the sugarcane Meena and Rahul ate} &= \left(\frac{1}{8} + \frac{5}{8} \right) \\ &= \frac{(1 + 5)}{8} = \frac{6}{8} \end{aligned}$$

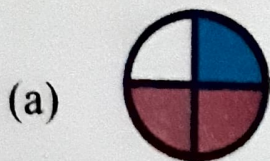
Hence, Meena and Rahul together ate $\frac{6}{8}$ part of the sugarcane.





Do it yourself -

- Write fractions for the red and blue portion of the given figures-



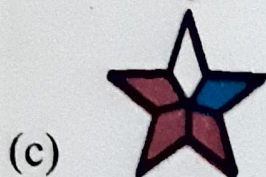
blue =

red =



blue =

red =



blue =

red =

- Add the fractions given below -

(a) $\frac{2}{5} + \frac{1}{5}$

(b) $\frac{4}{9} + \frac{3}{9}$

(c) $\frac{12}{17} + \frac{4}{17}$

Let's see - $\frac{9}{15}$ and $\frac{8}{15}$ are proper fractions. How will you add these fractions?

Solution : $\frac{9}{15} + \frac{8}{15} = \frac{9+8}{15}$

$$= \frac{17}{15}$$

$$= 1 \frac{2}{15}$$

After changing $\frac{17}{15}$ into a mixed fraction.



Addition of Mixed Numbers with the same denominators

$$\begin{aligned}
 & 2\frac{1}{3} + 4\frac{1}{3} \\
 &= \frac{7}{3} + \frac{13}{3} \\
 &= \frac{7+13}{3} \\
 &= \frac{20}{3} \\
 &= 6\frac{2}{3}
 \end{aligned}$$

While solving mixed fractions, first change them into improper fractions. Since the denominators are the same, we add the numerators.

Know this too -

$$\begin{aligned}
 & 2\frac{1}{3} + 4\frac{1}{3} \\
 &= 2 + 4 + \frac{1}{3} + \frac{1}{3} \\
 &= 6 + \frac{1+1}{3} \\
 &= 6 + \frac{2}{3} \\
 &= 6\frac{2}{3}
 \end{aligned}$$



Do it yourself -

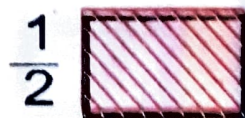
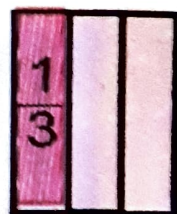
● $3\frac{1}{4} + 2\frac{1}{4}$

● $2\frac{1}{5} + 2\frac{2}{5}$

Addition of fractions with different denominators

Let us solve $\frac{1}{2} + \frac{1}{3}$

The size of both the pieces are different, in the figure given, hence it is not possible to add such fractions, unless these pieces are equal in size. For adding such fractions first make the denominators of the fractions equal so that all the pieces become equal.



To make the denominators same, we find out the L.C.M. of all the denominators. The denominators in $\frac{1}{2}$ and $\frac{1}{3}$ are 2 and 3. The LCM of these is 6.

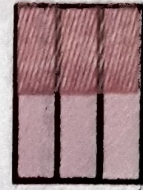
Now make the denominator of each fraction- 6

To convert denominator from 2 to 6 we multiply the numerator and denominator both by 3.

Similarly -

To convert the denominator from 3 to 6 we multiply the numerator and denominator both by 2.

$$\frac{1}{2} \times \frac{3}{3} = \frac{3}{6}$$



$$\frac{1}{2} = \frac{3}{6}$$

$$\frac{1}{3} \times \frac{2}{2} = \frac{2}{6}$$



$$\frac{1}{3} = \frac{2}{6}$$

$$\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$$

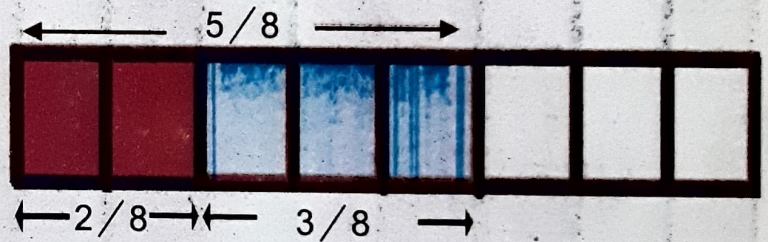


Look at this too -

$$\frac{1}{4} + \frac{3}{8}$$

$$\frac{1 \times 2}{4 \times 2} = \frac{2}{8}$$

$$\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$$



Do it yourself -

● Fill in the blanks -

(a) $\frac{1}{3} + \square = \frac{2}{3}$

(b) $\frac{1}{4} + \frac{3}{5} = \frac{3}{5} + \square$

● Solve -

(a) $\frac{3}{5} + \frac{2}{4}$

(b) $\frac{1}{3} + \frac{1}{5}$

Subtraction of Fractions

Example :

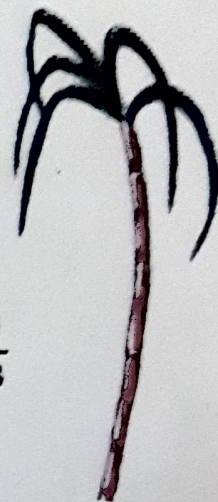
A sugarcane is divided into 8 equal parts. Meena ate $\frac{1}{8}$ part of the sugarcane, Rahul ate $\frac{5}{8}$ part of it. How much part of sugarcane did Rahul eat more than Meena?

Solution: Part of the sugarcane Rahul ate = $\frac{5}{8}$

Part of the sugarcane Meena ate = $\frac{1}{8}$

$$\begin{aligned}\text{The part of the sugarcane that Rahul ate more than Meena} &= \frac{5}{8} - \frac{1}{8} \\ &= \frac{5 - 1}{8} \\ &= \frac{4}{8}\end{aligned}$$

$\frac{4}{8}$ part of the sugarcane Rahul ate more than Meena.



Do it yourself -

● Solve :

(a) $\frac{9}{10} - \frac{4}{10}$

(b) $\frac{11}{25} - \frac{8}{25}$

(c) $\frac{14}{30} - \frac{7}{30}$

Subtraction of Mixed Fraction with the same denominators

$$\begin{aligned}3\frac{2}{5} - 2\frac{1}{5} \\ &= \frac{17}{5} - \frac{11}{5} \\ &= \frac{17 - 11}{5} \\ &= \frac{6}{5} \\ &= 1\frac{1}{5}\end{aligned}$$





Do it yourself -

● Solve -

$$(a) \quad 2\frac{3}{5} - 1\frac{2}{5}$$

$$(b) \quad 4\frac{5}{7} - 3\frac{2}{7}$$

Subtraction of Fraction with different denominators

1. Subtract $\frac{3}{5}$ from $\frac{2}{3}$

Here the denominators of both the fractions are different. So, first we make the denominators of both the fractions same. To make the denominators same, we will find the L.C.M. of both the denominators.

• L.C.M. of 3 and 5 = 15

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

To make the denominator equal to the L.C.M., numerator and denominator both are multiplied by 5.

$$\frac{3}{5} = \frac{3 \times 3}{5 \times 3} = \frac{9}{15}$$

To make denominator equal to the L.C.M., numerator and denominator both are multiplied by 3.

Subtract when denominators become the same-

$$\frac{10}{15} - \frac{9}{15} = \frac{10 - 9}{15} = \frac{1}{15}$$

2. What is the difference between $\frac{5}{6}$ and $\frac{2}{3}$?

To find the difference we will subtract $\frac{2}{3}$ from $\frac{5}{6}$

Since, denominators are different

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

$$\frac{5}{6} - \frac{4}{6} = \frac{5 - 4}{6} = \frac{1}{6}$$



Do it yourself -

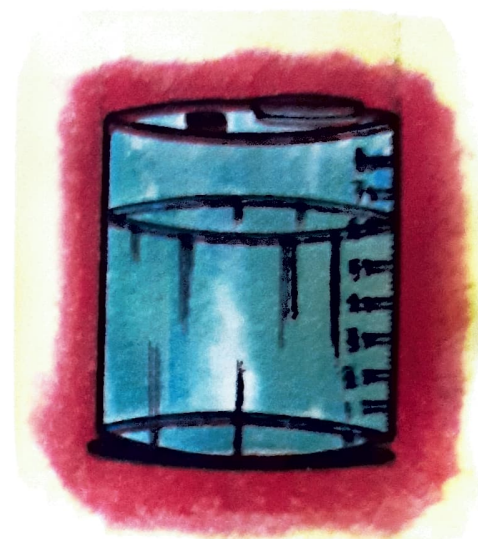
- How much is $\frac{1}{2}$ less than $2\frac{1}{4}$?
- What should be added to $\frac{2}{3}$ to get $\frac{5}{6}$?

Word Problem

Example 1- $\frac{6}{8}$ part of a tank is filled with water. How much part of the tank is empty?

Solution : Part of the tank filled with water = $\frac{6}{8}$

$$\begin{aligned} \text{Part of the tank which is empty} &= \frac{1}{1} - \frac{6}{8} \\ &= \frac{8-6}{8} = \frac{2}{8} \\ &= \frac{1}{4} \end{aligned}$$



Hence, $\frac{1}{4}$ part of the tank is empty.

We have learnt

- Sum of fractions with the same denominators =

$$\frac{\text{Sum of the numerators}}{\text{Same denominator of fractions}}$$

- Difference of fractions with the same denominators =

$$\frac{\text{Difference of numerators}}{\text{Same denominator of fractions}}$$





1. Solve -

(a) $\frac{9}{13} + \frac{5}{13}$

(b) $1 - \frac{7}{20}$

(c) $\frac{13}{15} - \frac{9}{15}$

2. What will be the sum of three tenth part and four tenth part?

3. What will be the difference between five seventh part and two seventh part?

4. Simplify -

(a) $2\frac{3}{4} + 2$

(b) $6\frac{3}{7} + 5\frac{4}{7}$

(c) $\frac{9}{7} - \frac{2}{3}$

5. (a) By how much is $\frac{4}{8}$ less than 1?

(b) What should be subtracted from 2 to make it $1\frac{1}{4}$?

6. A frog jumped $\frac{7}{10}$ metre in first time and $\frac{3}{10}$ metre in second time.

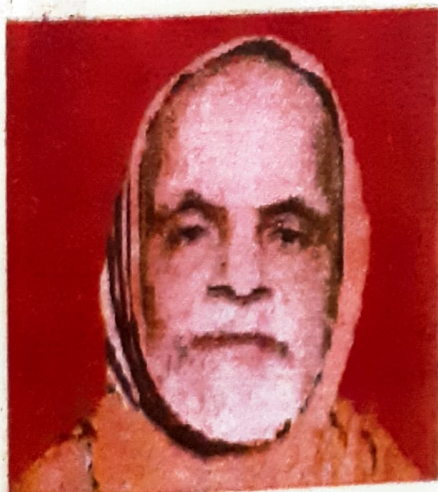


In which attempt was his jump longer and by how much?

7. What should be added to $\frac{1}{16}$ to make it whole?

8. If $\frac{1}{5}$ part of a pole of a flag is under the ground, how much part of it will be above the ground?

Great Mathematician



Swami Bharti Krishna Teertha

He was the Shankaracharya of Jagannathpuri. He surprised the whole world by inventing Vedic Mathematics. He formulated 16 *Mool Sutras* and 13 *Upsutras*. According to him, the Vedic Mathematics develops both left and right (logicality and creativity) parts of our brain equally.