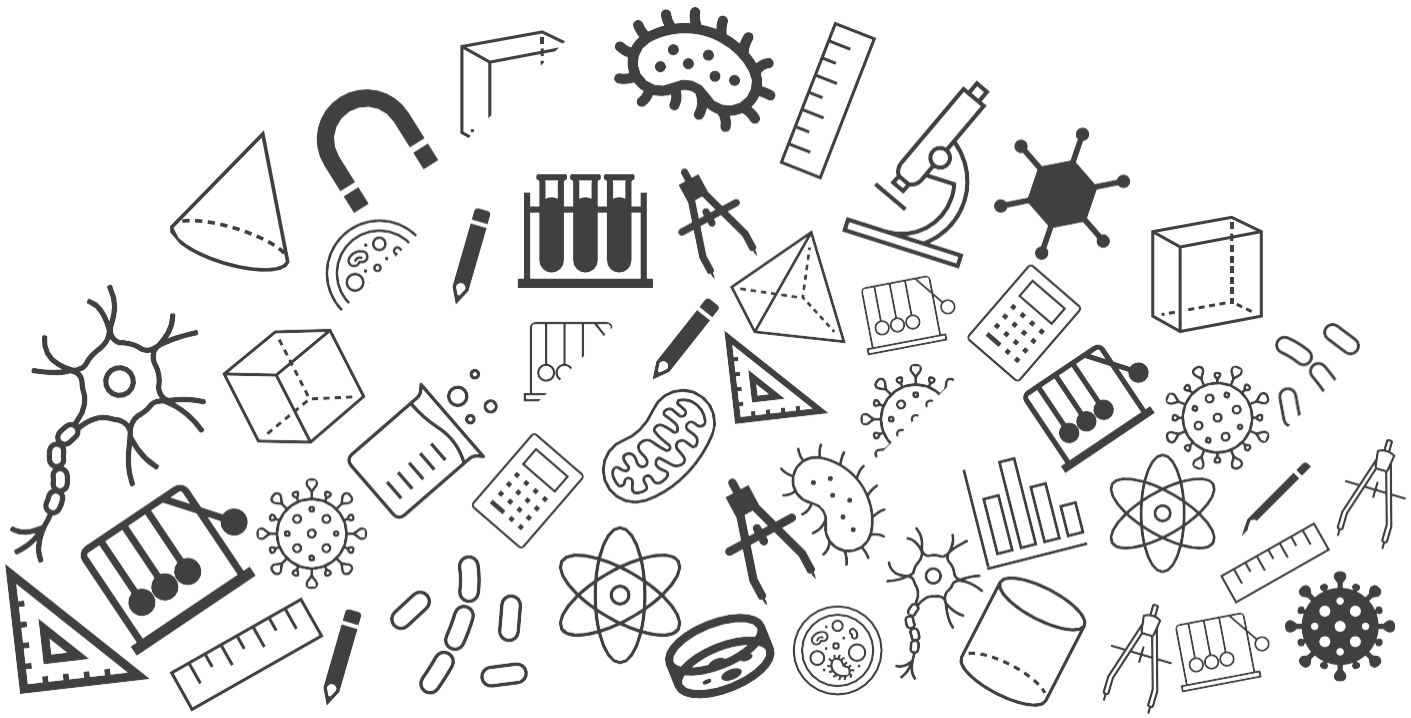
Grade 06
Maths Chapter Notes

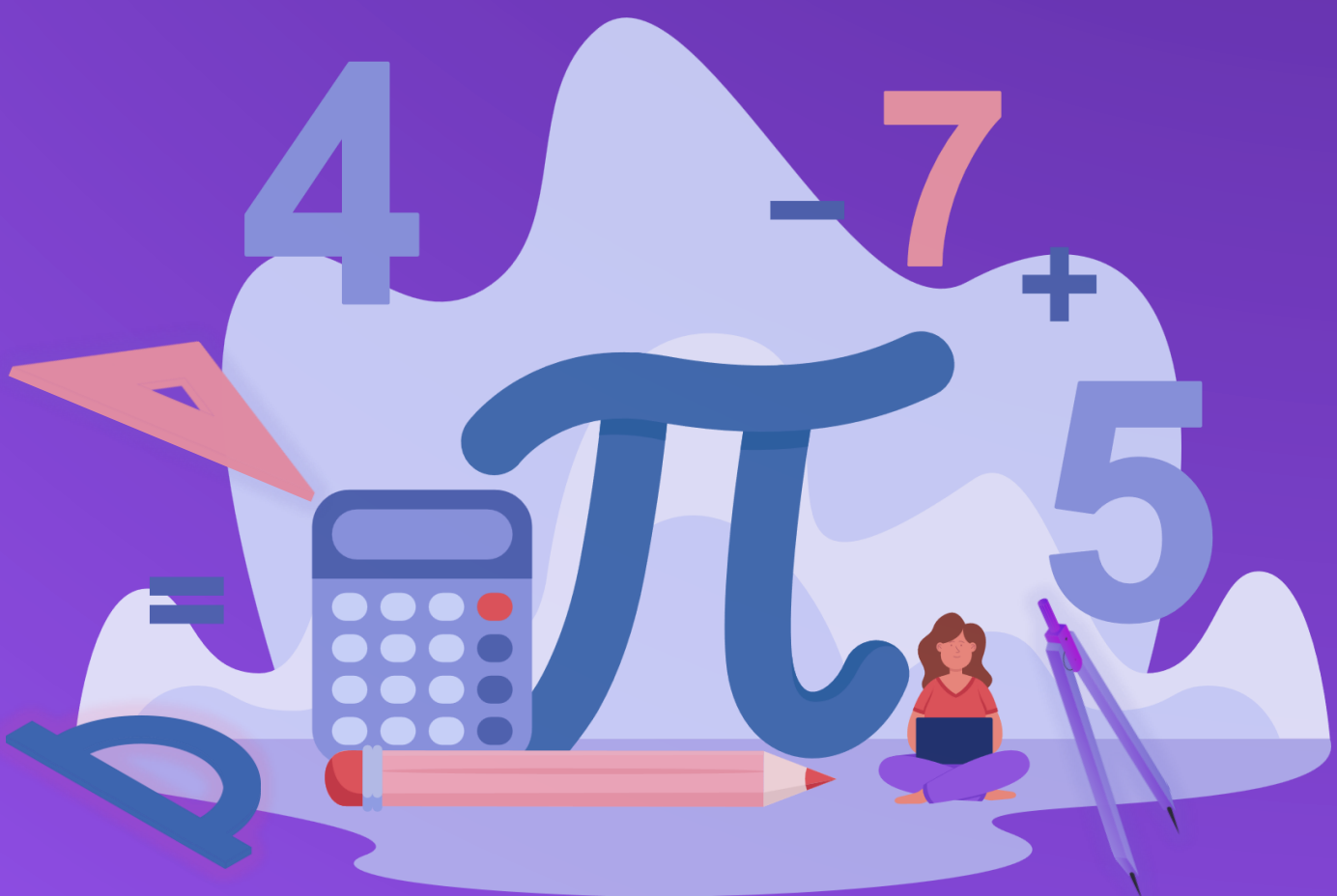


BYJU'S Classes

Chapter Notes

Fractions

Grade 06



Topics to be Covered

1. Fractions

1.1. Representation of a Fraction

2. Types of Fractions

2.1. Proper Fraction
2.2. Improper Fraction
2.3. Mixed Fraction

3. Conversion of Fractions

3.1. Mixed Fraction to Improper Fraction
3.2. Improper Fraction to Mixed Fraction

4. Fractions on a Number Line

5. Equivalent Fractions

5.1. Simplest Form of a Fraction

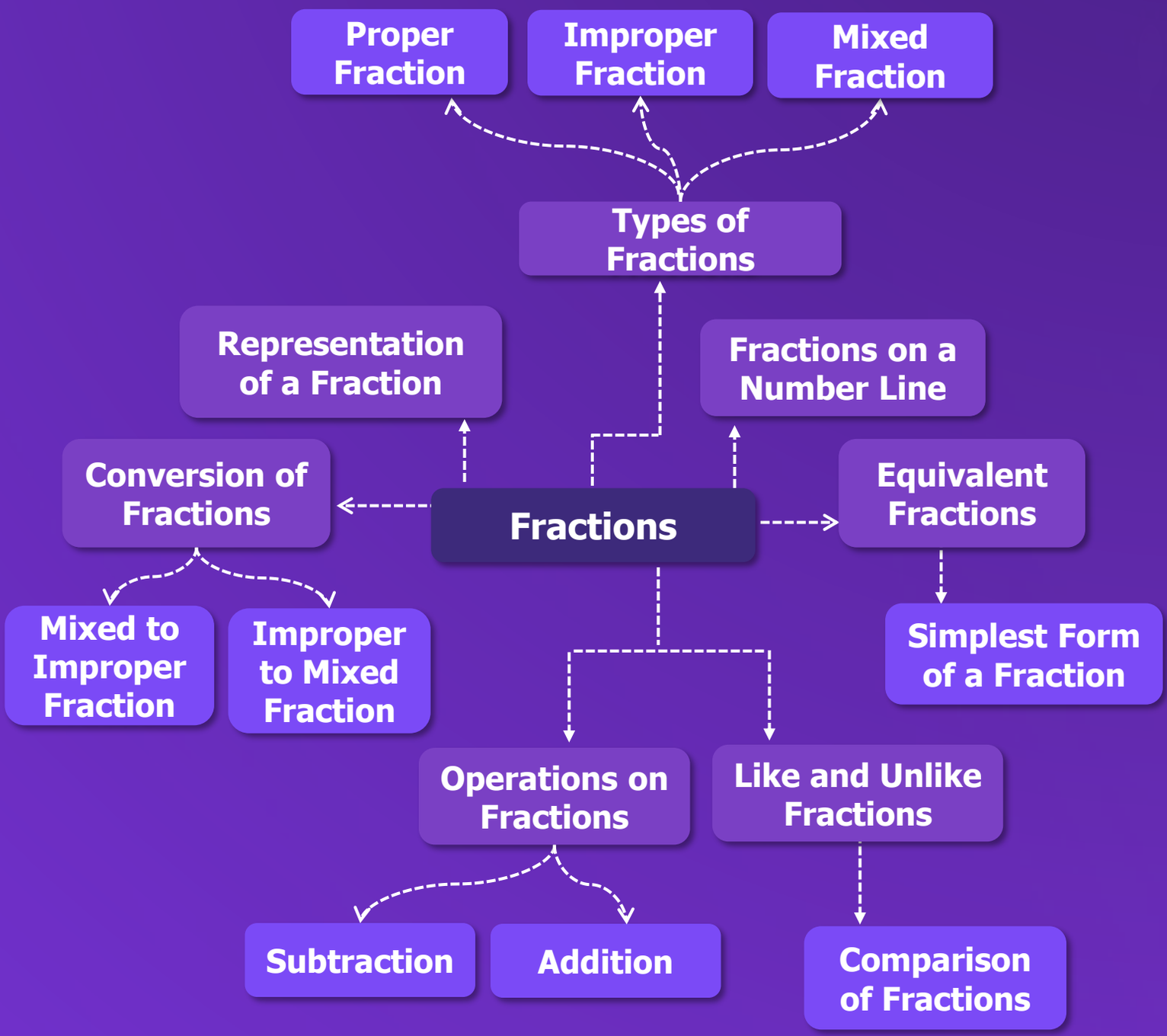
6. Like and Unlike Fractions

6.1. Comparison of Fractions

7. Operations on Fractions

7.1. Addition
7.2. Subtraction

Mind Map


Proper Fraction
Improper Fraction
Mixed Fraction
Types of Fractions
Representation of a Fraction
Fractions on a Number Line
Conversion of Fractions
Fractions
Equivalent Fractions
Mixed to Improper Fraction
Improper to Mixed Fraction
Simplest Form of a Fraction
Operations on Fractions
Like and Unlike Fractions
Subtraction
Addition
Comparison of Fractions

1. Fractions

A fraction is a number representing part of a whole. The whole may be a single object or a group of objects.

1.1. Representation of a Fraction

Consider the given example of a fraction,

$$\frac{3}{4}$$

3 — Numerator

4 — Denominator

The top number represents the number of selected equal parts. It is called the numerator.
The bottom number represents the total number of equal parts of a whole. It is called the denominator.
The horizontal line that we see in a fraction is called the Vinculum. In Latin, it means 'chain'.

$\frac{1}{4}$

$\frac{2}{8}$

2. Types of Fractions

2.1. Proper Fraction

Fraction in which the numerator is less than the denominator is called a proper fraction.

For Example: $\frac{5}{9}$

2.2. Improper Fraction

Fraction in which the numerator is greater than the denominator is called an improper fraction.

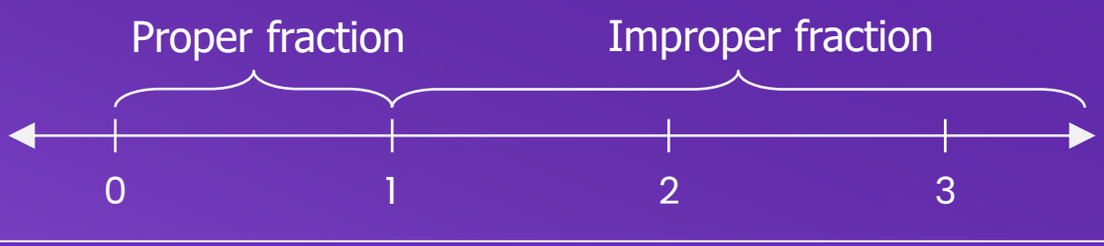
For Example: $\frac{7}{4}$

2.3. Mixed Fraction

Mixed fraction is a combination of a whole number and a proper fraction.

For Example: $5\frac{3}{5}$

Proper fraction lie to the left of 1 as it is less than 1. Improper fraction lie to the right of 1 as it is greater than 1



3. Conversion of Fractions

3.1. Mixed Fraction to Improper Fraction

$$\text{Mixed fraction} = \text{Whole number(r)}\,\frac{\text{Numerator(p)}}{\text{Denominator(q)}}$$

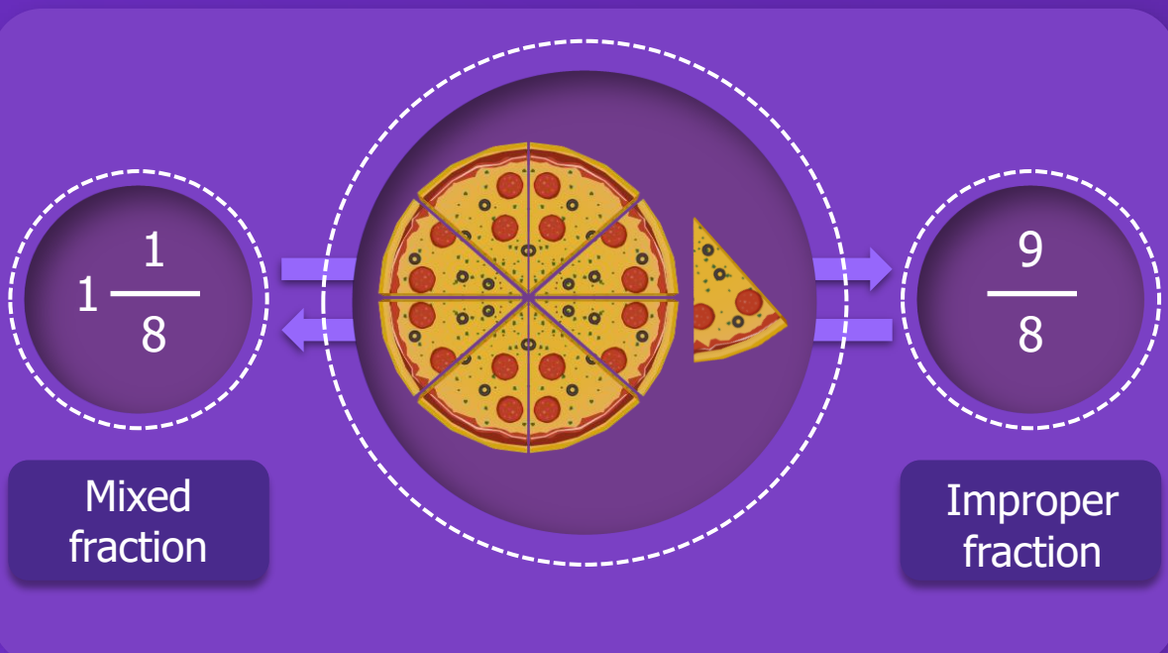
Step 1: Multiply the whole number with the denominator.
Step 2: Add that number to the numerator.
Step 3: Write that sum on top of the original denominator.

$$\text{Improper fraction} = \frac{(r \times q) + p}{q}$$

For example:

$$\text{Mixed fraction} = 9\frac{3}{4}$$

$$\text{Improper fraction} = \frac{(9 \times 4) + 3}{4} = \frac{39}{4}$$



3. Conversion of Fractions

3.2. Improper Fraction to Mixed Fraction

Improper fraction $= \frac{p}{q}$ — p → Dividend, q → Divisor

Step 1: Divide the numerator by the denominator.
Step 2: Write down the whole number part of the quotient.
Step 3: Take the remainder and write it on top of the original denominator.

$$\text{Mixed fraction} = \text{Quotient}\,\frac{\text{Remainder}}{\text{Divisor}}$$

For example:

$$\text{Improper fraction} = \frac{39}{4}$$

$$4 \,\overline{)\,39\,}\, 9$$

$$\begin{array}{r} 39 \\ -36 \\ \hline 3 \end{array}$$

$$\text{Mixed fraction} = 9\frac{3}{4}$$

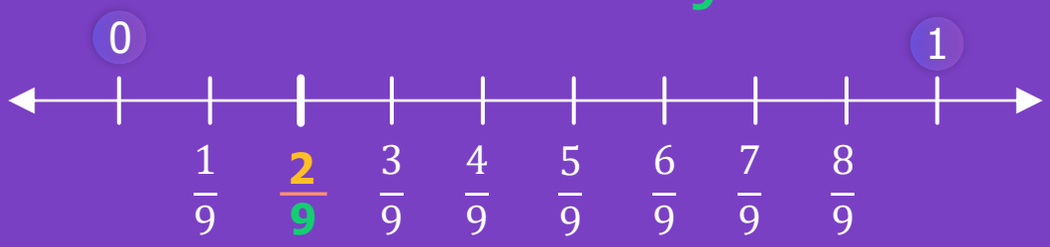
4. Fractions on a Number Line

Proper Fraction

For representing proper fraction $\frac{p}{q}$ on a number line, divide the number line between 0 and 1 into q equal parts and mark the pth part as $\frac{p}{q}$.

$\frac{\text{p}}{\text{q}}$ → Part to be picked
$\frac{\text{p}}{\text{q}}$ → Total number of parts

For example: $\frac{2}{9}$



4. Fractions on a Number Line

Improper Fraction

$\frac{t}{q}$ ⟶ **Improper fraction**

Convert it into mixed fraction

$r\frac{p}{q}$ ⟶ Part to be picked
⟶ Total number of parts

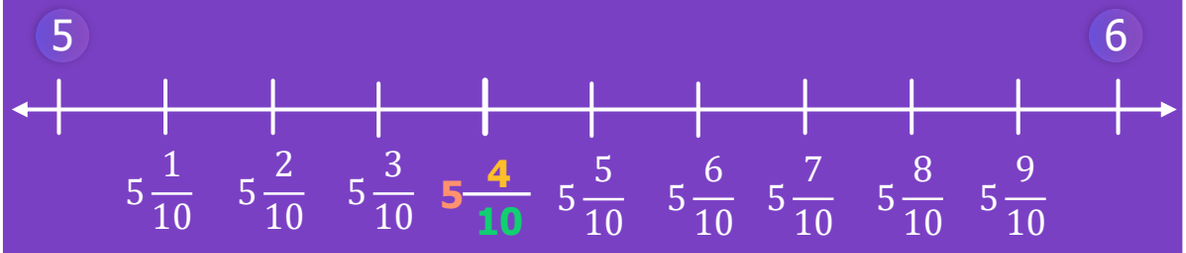
Number will lie between **r** and **r+1.**

Divide the number line between r and r+1 into q equal parts and mark the p^{th} part as $r\frac{p}{q}$

For example: $\frac{54}{10}$

$$\frac{54}{10} = 5\frac{4}{10}$$

Number will lie between **5** and **5+1(=6)**.



5. Equivalent Fractions

Equivalent fractions are the fractions that have different numerators and denominators but are equal to the same value.

For example, $\frac{2}{4}$ and $\frac{3}{6}$ are equivalent fractions, because they both are equal to $\frac{1}{2}$.

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

To get an equivalent fraction of a given fraction, multiply or divide both the numerator and denominator by the same number.

By multiplication

$$\frac{2 \times \boxed{2}}{9 \times \boxed{2}} = \frac{4}{18}$$

By division

$$\frac{12 \div \boxed{3}}{15 \div \boxed{3}} = \frac{4}{5}$$

5. Equivalent Fractions

5.1. Simplest Form of a Fraction

A fraction is said to be in the simplest (or lowest) form if its numerator and denominator have no common factor except 1.

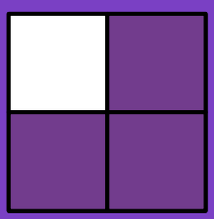
$$\frac{36}{54} = \frac{36 \div 2}{54 \div 2} = \frac{18 \div 9}{27 \div 9} = \boxed{\frac{2}{3}}$$

Simplest form

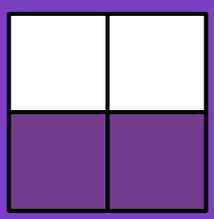
6. Like and Unlike Fractions

Like Fractions

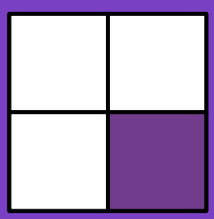
Fractions with same denominator.



$\frac{1}{4}$



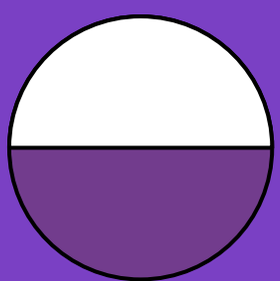
$\frac{2}{4}$



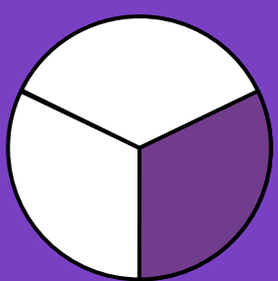
$\frac{3}{4}$

Unlike Fractions

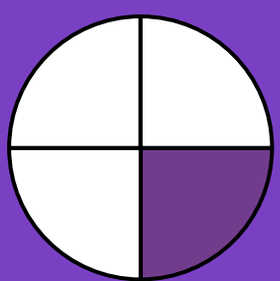
Fractions with different denominators.



$\frac{1}{2}$



$\frac{2}{3}$



$\frac{3}{4}$

6. Like and Unlike Fractions

6.1. Comparison of Fractions

- If the fractions are like, then the fraction with the greater numerator is greater of the two.
  Example: $\frac{4}{5} < \frac{6}{5}$
- If the fractions are unlike but the numerators are the same, then the fraction with the smaller denominator is greater of the two.
  Example: $\frac{3}{4} > \frac{3}{5}$
- If the fractions are unlike and the numerators are different, convert the unlike fractions into like fractions and compare the two.

Compare $\frac{2}{3}$ and $\frac{3}{4}$

↓

Conversion to like fractions

L.C.M of 3 and 4 is 12.

$$\frac{2}{3} = \frac{2 \times 4}{3 \times 4} = \mathbf{\frac{8}{12}}, \quad \frac{3}{4} = \frac{3 \times 3}{4 \times 3} = \mathbf{\frac{9}{12}}$$

↓

Comparison of like fractions

As $8 < 9$,

$$\frac{8}{12} < \frac{9}{12} \Rightarrow \mathbf{\frac{2}{3} < \frac{3}{4}}$$

7. Operations on Fractions

7.1. Addition

Addition of fractions:

- If the fractions are like, then add the numerators and keep the denominator same to get the result.

$$\frac{4}{5}+\frac{6}{5}=\frac{4+6}{5}=\frac{10}{5}$$

- If the fractions are unlike, in that case first convert them into like fractions and then add.

Add $\frac{3}{4}$ and $\frac{2}{5}$

Conversion to like fractions

L.C.M of 4 and 5 is 20.

$$\frac{3}{4}=\frac{3\times 5}{4\times 5}=\mathbf{\frac{15}{20}},\ \frac{2}{5}=\frac{2\times 4}{5\times 4}=\mathbf{\frac{8}{20}}$$

Addition of like fractions

$$\frac{15}{20}+\frac{8}{20}=\frac{23}{20}$$

7. Operations on Fractions

7.2. Subtraction

Subtraction of fractions:

- If the fractions are like, then subtract the numerators and keep the denominator same to get the result.

$$\frac{6}{5} - \frac{4}{5} = \frac{6-4}{5} = \frac{2}{5}$$

- If the fractions are unlike, in that case first convert them into like fractions and then subtract.

Subtract $\frac{2}{5}$ from $\frac{3}{4}$

Conversion to like fractions

L.C.M of 4 and 5 is 20.

$$\frac{3}{4} = \frac{3 \times 5}{4 \times 5} = \mathbf{\frac{15}{20}}, \quad \frac{2}{5} = \frac{2 \times 4}{5 \times 4} = \mathbf{\frac{8}{20}}$$

Subtraction of like fractions

$$\frac{15}{20} - \frac{8}{20} = \frac{7}{20}$$