

Fractions and Decimals

Introduction

Fractions and decimals are used to represent parts of a whole. They are commonly used in daily life while measuring length, weight, money, time, and quantity. This chapter explains the types of fractions, operations on fractions, decimals, and the relationship between fractions and decimals.

What are Fractions?

Definition

A **fraction** represents a part of a whole or a collection.

A fraction has two parts:

- **Numerator:** The number above the line.
- **Denominator:** The number below the line.

Example: In $\frac{3}{5}$, 3 is the numerator and 5 is the denominator.

Types of Fractions

Different Types

Some common types of fractions are:

- **Proper Fraction:** Numerator is smaller than the denominator (e.g., $\frac{3}{7}$).
 - **Improper Fraction:** Numerator is greater than or equal to the denominator (e.g., $\frac{9}{5}$).
 - **Mixed Fraction:** A whole number and a fraction together (e.g., $2\frac{1}{3}$).
 - **Equivalent Fractions:** Fractions having the same value (e.g., $\frac{1}{2} = \frac{2}{4}$).
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Addition and Subtraction of Fractions

Rules

Fractions with the **same denominator** can be added or subtracted by adding or subtracting the numerators.

If the denominators are **different**, first convert them into equivalent fractions with a common denominator.

Examples:

- $2/7 + 3/7 = 5/7$
- $5/6 - 1/6 = 4/6 = 2/3$

Multiplication and Division of Fractions

Operations on Fractions

Multiplication:

Multiply the numerators together and the denominators together.

Example:

$$2/3 \times 4/5 = 8/15$$

Division:

Multiply the first fraction by the reciprocal of the second fraction.

Example:

$$2/3 \div 4/5 = 2/3 \times 5/4 = 5/6$$

What are Decimals?

Definition

A **decimal** is another way of representing fractions whose denominators are 10, 100, 1000, and so on.

Examples:

- 0.5

- 2.75
- 10.08

The digits after the decimal point represent tenths, hundredths, thousandths, etc.

Operations on Decimals

Addition, Subtraction, Multiplication, and Division

Addition and Subtraction:

Arrange the numbers according to their decimal points and perform the operation.

Multiplication:

Multiply as whole numbers and place the decimal point correctly in the answer.

Division:

Convert the divisor into a whole number by shifting the decimal point equally in both numbers, then divide.

Conversion Between Fractions and Decimals

Methods

A fraction can be converted into a decimal by dividing the numerator by the denominator.

A decimal can be converted into a fraction by writing it over 10, 100, or 1000 and simplifying it.

Examples:

- $\frac{3}{4} = 0.75$
 - $0.6 = \frac{6}{10} = \frac{3}{5}$
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Applications of Fractions and Decimals

Daily Life Uses

Fractions and decimals are used in:

- Measuring length and weight.
 - Buying and selling goods.
 - Calculating money.
 - Cooking and recipes.
 - Reading marks and percentages.
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Key Points

- A fraction represents a part of a whole.
 - Fractions can be proper, improper, mixed, or equivalent.
 - Decimals represent fractions with denominators like 10, 100, and 1000.
 - Decimal points must be aligned while adding or subtracting decimals.
 - Fractions and decimals can be converted into each other.
 - Both are widely used in everyday life.
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Chapter Summary

Fractions and decimals help us represent quantities that are less than or greater than a whole. This chapter explains different types of fractions, operations on fractions and decimals, and methods of converting one form into another. These concepts are essential for solving mathematical problems in school and daily life.