

The Panda Math Tutor

www.thepandamathtutor.com

Fraction Equivalence and Operations

IGCSE Mathematics

Prepared by
Nikolas Agisilaou

Quality Mathematics Education for Students

Contents

1	Introduction to Fractions	2
2	Understanding Fractions	2
3	Equivalent Fractions	4
4	Comparing and Ordering Fractions	7
5	Adding and Subtracting Fractions	8
5.1	Adding and Subtracting Mixed Numbers	10
6	Multiplying Fractions	11
7	Dividing Fractions	13
8	Order of Operations with Fractions	16
9	Fractions and Decimals	17
10	Real-World Applications	19
10.1	Worked Problems	19
11	Summary	21
12	Additional Resources	23
12.1	Tips for Success in IGCSE Exams	23
12.2	Common Exam Questions	23

1 Introduction to Fractions

Note

Fractions are one of the most important topics in IGCSE Mathematics. A solid understanding of fraction equivalence and operations is essential for algebra, ratio, proportion, and many other areas of mathematics.

In this chapter, we will explore:

- What fractions represent and their key terminology
- Equivalent fractions and simplifying
- Converting between improper fractions and mixed numbers
- Adding and subtracting fractions
- Multiplying and dividing fractions
- Order of operations with fractions
- Applications to real-world problems

2 Understanding Fractions

Definition

A **fraction** represents a part of a whole. It is written in the form:

$$\frac{a}{b}$$

where:

- a is the **numerator** (the number of parts we have)
- b is the **denominator** (the total number of equal parts the whole is divided into)
- $b \neq 0$ (we cannot divide by zero)

Example: In the fraction $\frac{3}{8}$, the numerator is 3 and the denominator is 8. This means 3 out of 8 equal parts.

Definition

Fractions can be classified into three types:

- **Proper fraction:** The numerator is less than the denominator.
Examples: $\frac{2}{5}$, $\frac{7}{12}$, $\frac{1}{3}$. These are always less than 1.
- **Improper fraction:** The numerator is greater than or equal to the denominator.
Examples: $\frac{9}{4}$, $\frac{15}{7}$, $\frac{6}{6}$. These are greater than or equal to 1.
- **Mixed number:** A whole number combined with a proper fraction.
Examples: $2\frac{1}{4}$, $3\frac{5}{8}$, $1\frac{2}{3}$.

Method**Converting Between Improper Fractions and Mixed Numbers****Improper fraction $\rightarrow$ Mixed number:**

Step 1: Divide the numerator by the denominator

Step 2: The quotient becomes the whole number part

Step 3: The remainder becomes the new numerator

Step 4: The denominator stays the same

Mixed number $\rightarrow$ Improper fraction:

Step 1: Multiply the whole number by the denominator

Step 2: Add the numerator to the result

Step 3: Write this total over the original denominator

Formula: $a\frac{b}{c} = \frac{a \times c + b}{c}$

Example

(a) Convert $\frac{23}{5}$ to a mixed number.

(b) Convert $4\frac{3}{7}$ to an improper fraction.

Preview ends here

21 more pages are in the full pack.

Fraction Equivalence and Operations — Main Notes — €9.99

Buy the pack and the complete PDF lands in your inbox.

Personal study use only — please don't resell or share.