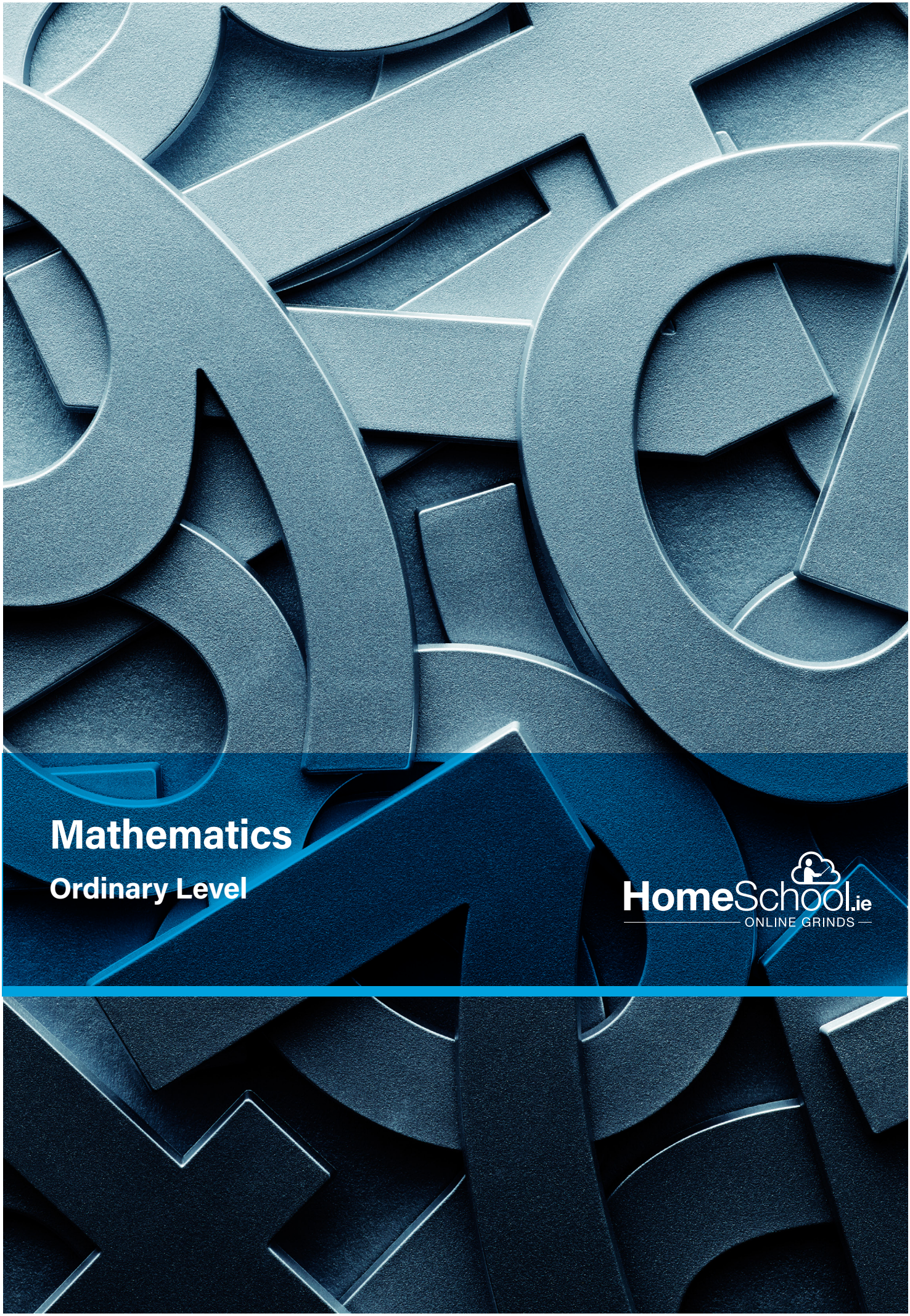


Mathematics

Ordinary Level

HomeSchool.ie
ONLINE GRINDS

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Subject: Mathematics

Lesson 1: Algebra I

1.0 Learning Intentions

By the end of this week's lesson you should be able to:

- Explain the mathematical words of algebra
- Add and subtract algebraic expressions
- Multiply and divide algebraic expressions
- Perform algebraic substitution
- Add and subtract algebraic fractions

1.01 Syllabus

Section 4.1 of the Leaving Certificate Project Maths Syllabus states that students must be familiar with algebraic expressions. This includes addition, subtraction, multiplication and division. It also includes evaluating expressions and working with fractions.

1.02 Chief Examiner's Report

In the 2015 report, the Chief Examiner commented on the difficulties that students had in relation to algebra. In particular, the CE report, discussed the lack of knowledge that candidates displayed in relation to the basic concepts of algebra and a lack of preservance, citing it as a cause fr concern. Later, this report has cautioned on the importance of algebra for addressing other questions throughout the paper and the fundamental need for students to have a good solid understanding of the basic concepts.

1.1 Overview of Algebra

There are several keywords that we must first look:

$$3x^2 - 7x + 4$$

$3 \rightarrow$ coefficient
$x^2 \rightarrow$ variable
$4 \rightarrow$ constant
$3x^2 \rightarrow$ term
$3x^2 - 7x + 4 \rightarrow$ algebraic expression

1.2 Adding Algebra

Addition Rule for Algebra:

When adding algebra, we can only add terms that are exactly the same.
These are called "like terms". These terms must also have exactly the same power.

Practice Questions:

$3x + 4 + 2x + 7 =$

$4a + 14b + 12a + 7b =$

$13x + 15y + 10z + 3x + 10y + 4z =$

$9c + 4d + 2c + 14 =$

1.3 Subtraction of Algebra

Subtraction Rule for Algebra:

When subtracting algebra, we can only subtract terms that are exactly the same.
These are called "like terms". These terms must also have exactly the same power.

Practice Questions:

$-4x + 6y - 2x + 7y =$

$-10a + 14b - 7a - 9b =$

$-17x^2 + 4x - 7x^2 - 6x =$

1.4 Multiplication of Algebra

Multiplication Rule for Algebra:

Multiplication of Algebra works different from adding or subtracting algebraic terms. The rule for multiplication is to multiply the signs by the sign, number by the number and finally the letter by the letter.

The Snail Method (Multiplying & Dividing Algebra):

S Signs

N → Numbers

A → and

I → in a while

L → Letters

Remember same signs are positive, different signs are negative.

Practice Questions: Simplify the following

$$3(4x + y)$$

$$-5(3x + 5y)$$

$$9(4a + b) + 7a(a + b)$$

$$9x(-3x + 4y) - 10x(-9x + 3y)$$

1.5 Division of Algebra

Division Rule for Algebra:

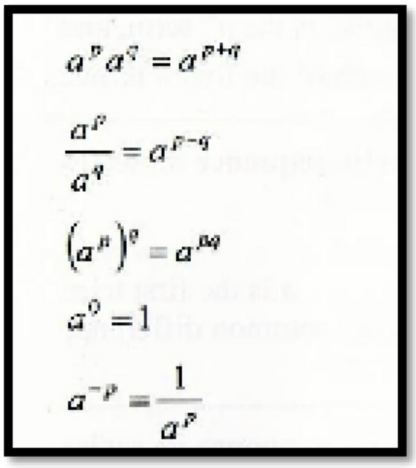
Division of Algebra works similar to that of multiplying of algebra. The rule for Division are to divide the signs by the sign, number by the number and finally the letter by the letter.

Practice Questions: Simplify the following

$$\frac{-21x^4}{7x^2}$$

$$\frac{-121x^7}{11x^4}$$

Don't forget to use your maths table to assist you when dealing with indices (Page 23):



1.6 Algebraic Substitution

We can sub in values for variables and then evaluate the outcome.
This process is known as algebraic substitution.

Find the value of $3a + 2b$ when $a = 7$ and $b = 2$

$$3(a) + 2(b)$$
$$= 3(7) + 2(2)$$
$$= 21 + 4$$
$$= 25$$

Practice Questions:

Find the value of the following when $a = -4$, $b = 5$ and , $c = -2$

$4a + 5b - 3c$

$-3a + 2b - 7c$

$10a + 12b - 30c$

1.7 Algebraic Fractions

In your course, you can also be asked to simplify algebraic fractions. This process requires you to find the LCM (Lowest Common Multiple).

Practice Questions:

$$\frac{x}{7} + \frac{4x}{35}$$

$$\frac{2x+5}{10} + \frac{3x+5}{5}$$

$$\frac{-5x-4}{4} - \frac{2x+6}{3}$$

1.8 Homework

Simplify 3(4-5x) - (2(5-6x)