

Introduction to
A level Maths
Induction
Lesson



Introduction

Watch first two minutes

<https://www.youtube.com/watch?v=S8uhelt9lec>

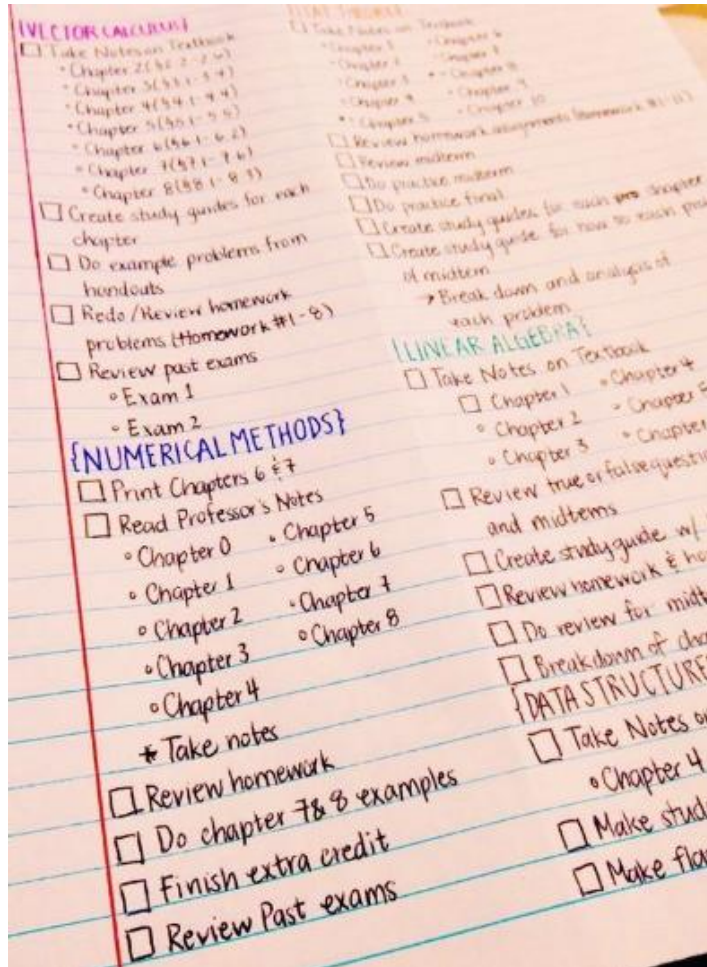


What to Expect in A level Maths

You need to enjoy Maths and be prepared to work hard throughout the two years.



What to Expect in A level Maths



The quantity of work is more than GCSE, so you will need to organise your time well.

What to Expect in A level Maths

You will have five taught maths lessons each week split between two teachers. Expect that homework will be set regularly and there will be a deadline for the work to be produced.



What to Expect in A level Maths



You will be provided with a folder, which has dividers to help you to organise your work.

What to Expect in A level Maths

You will have one extra piece of work set each week in addition to your homework that needs to be completed independently. This will be in the form of bridging work from GCSE to A level



What to Expect in A level Maths



At the end of year 13 you will sit the final A Level exam. This is made up of three 2 hour exams as follows:

Paper 1

Pure Maths

Paper 2

Pure Maths

Paper 3

Statistics/Mechanics

What to Expect in A level Maths

Pure Maths Topics:

Proof

Algebra & Functions

Co-ordinate Geometry

Sequences & Series

Trigonometry

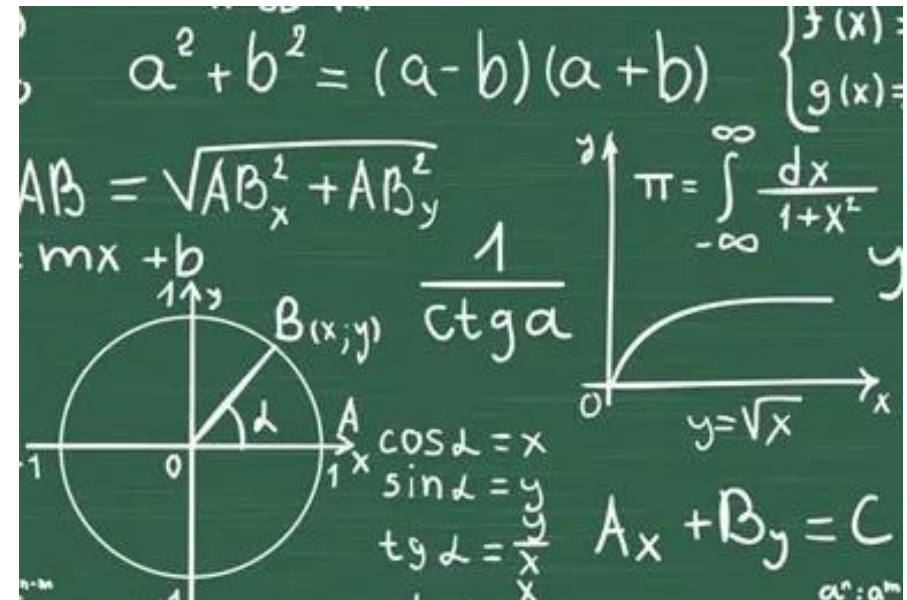
Exponentials & Logarithms

Differentiation

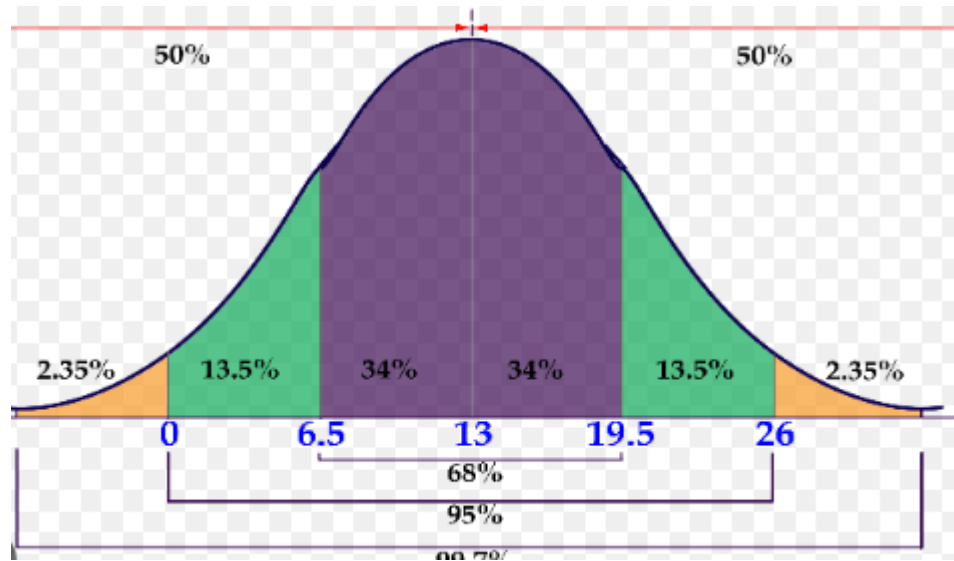
Integration

Numerical Methods

Vectors



What to Expect in A level Maths



Statistics Topics:

Statistical Sampling
Data Presentation & Interpretation
Probability
Statistical distributions
Statistical Hypothesis Testing

What to Expect in A level Maths

Mechanics Topics:

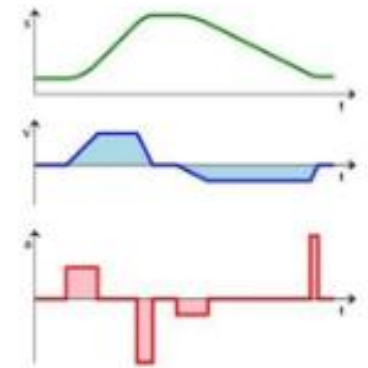
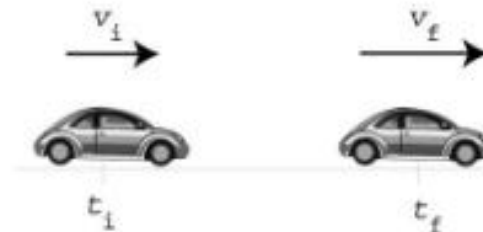
Quantities & Units in Mechanics

Kinematics

Forces & Newton's Laws

Moments

1. $v = v_0 + at$
2. $\Delta x = \left(\frac{v + v_0}{2}\right)t$
3. $\Delta x = v_0t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$



The background of the slide features a collection of school supplies on a teal surface. On the left, a portion of a calculator is visible with buttons for percentage, multiplication, and addition. Below it is a light blue folder. In the center, there is a silver compass and a yellow pencil sharpener. To the right, a yellow ruler and a blue set square are visible. A teal binder clip is also present. The text 'Introduction to A level Maths Summer Work' is centered over the image.

Introduction to A level Maths Summer Work



To Help You Prepare for A Level Maths:

You will have had a long period of time without doing much Maths work so to help you get back into the swing of things we have set you some transitional work which you can start working on.

You have from now until when you join us in September to get this completed.



This work forms part of your probationary period and will help us to judge whether you are suited to A level Maths.

Holiday homework:

The holiday homework is printed and is made up of five sections. These are: Rearranging formula, Quadratics, Algebraic reasoning, Straight lines and Algebraic fractions.

These are all mathematical skills that you covered in year 11. In each section there is also a list of videos on Corbett maths that you can use to help you if you are stuck.

These need completing by the time you start in September. Take your time and work through them properly. The purpose of this work is to set you up well for your A-level studies.



Starter Activity

At the start of every Maths Lesson you will be given a starter activity which consists of six questions all linked to previous work.

The purpose of this is to provide the opportunity for continuous recall and recap.

On the next slide is an example of a starter.



Complete these Questions.

1. Expand $7x^2(2 - x)$

2. Solve $x + 4y = 16$
 $3x + 5y = 20$

3. Show the solution to this inequality on a number line:

$$4 - x > 6$$

4. Find the gradient of the straight line which passes through $(12, 7)$ and $(18, 10)$

Solutions

- | | |
|----|--|
| 1. | Expand $7x^2(2 - x)$ |
| 2. | Solve $x + 4y = 16$
$3x + 5y = 20$ |
| 3. | Show the solution to this inequality on a number line:

$4 - x > 6$ |
| 4. | Find the gradient of the straight line which passes through $(12, 7)$ and $(18, 10)$ |

1) $14x^2 - 7x^3$

2) $x = 0, y = 4$

3) $x < -2$

4) Gradient = $\frac{1}{2}$



Algebra Activity

Algebra skills are a basic requirement for most of the A level work

At GCSE you learnt how to factorise expressions.

The expressions might have been Linear or Quadratic

You also learnt how to simplify fractions.



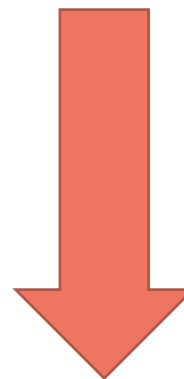
We are now going to do an activity which requires us to factorise in order to simplify fractions.

Example 1

$$\frac{x^2 - x}{x^2 + 2x}$$



$$\frac{\cancel{x}(x - 1)}{\cancel{x}(x + 2)}$$



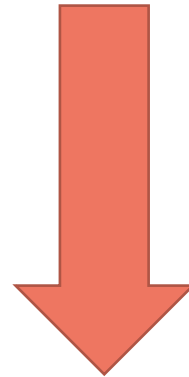
$$\frac{x - 1}{x + 2}$$

Example 2

$$\frac{x^2 + 3x - 4}{x^2 + 7x + 12}$$



$$\frac{(x + 4)(x - 1)}{(x + 4)(x + 3)}$$



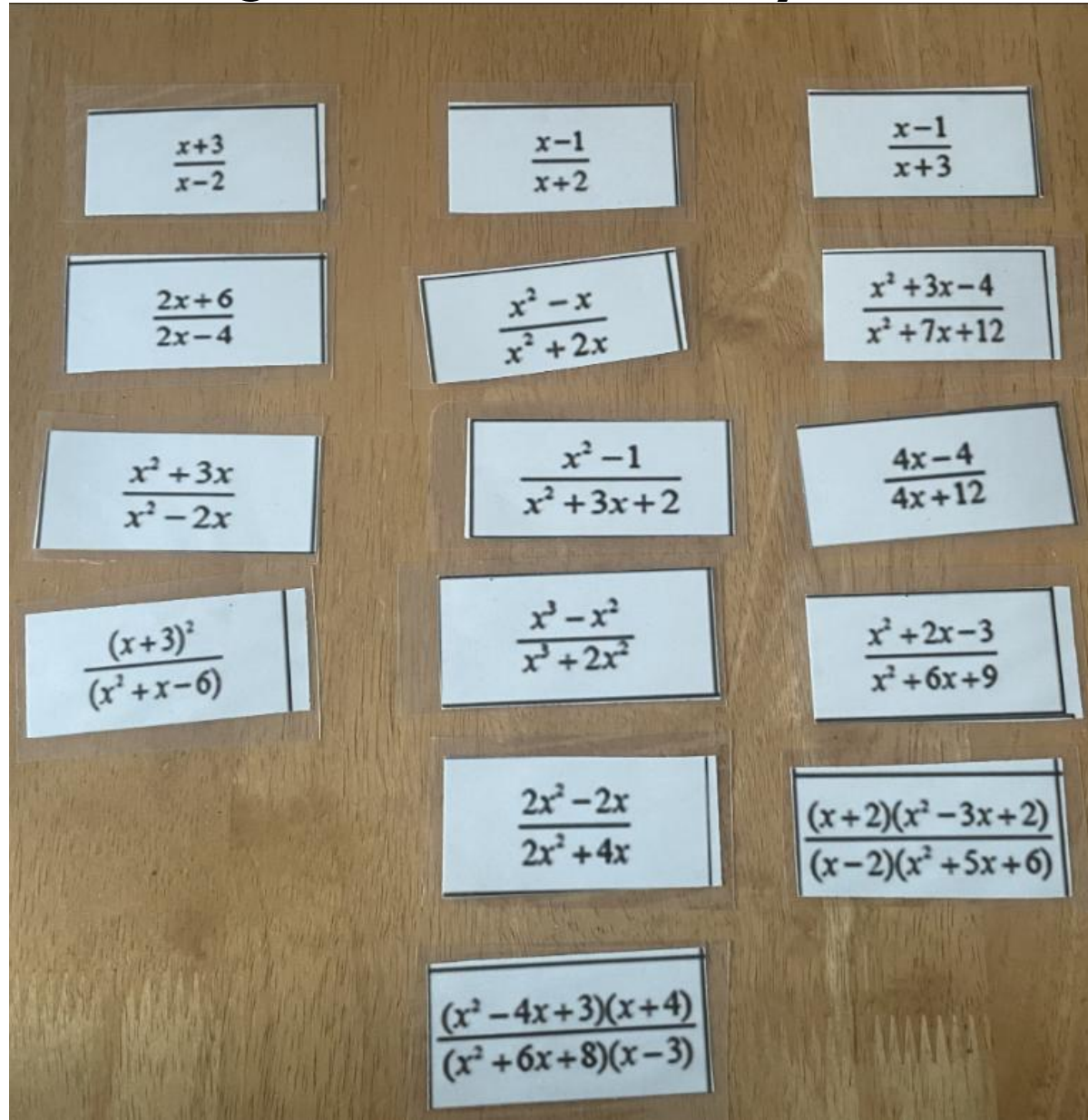
$$\frac{x - 1}{x + 3}$$

$\frac{x^2 - x}{x^2 + 2x}$	$\frac{x^2 + 3x - 4}{x^2 + 7x + 12}$
$\frac{(x+2)(x^2 - 3x + 2)}{(x-2)(x^2 + 5x + 6)}$	$\frac{x+3}{x-2}$
$\frac{2x+6}{2x-4}$	$\frac{x-1}{x+2}$
$\frac{(x^2 - 4x + 3)(x+4)}{(x^2 + 6x + 8)(x-3)}$	$\frac{x-1}{x+3}$
$\frac{x^2 + 3x}{x^2 - 2x}$	$\frac{(x+3)^2}{(x^2 + x - 6)}$
$\frac{x^2 - 1}{x^2 + 3x + 2}$	$\frac{x^2 + 2x - 3}{x^2 + 6x + 9}$

$\frac{4x-4}{4x+12}$	$\frac{2x^2-2x}{2x^2+4x}$
$\frac{x^3-x^2}{x^3+2x^2}$	$\frac{x^2+2x-3}{x^2+6x+9}$

You need to simplify the fractions to find three sets of equivalent fractions.

Solution to Algebra Activity from earlier in this work.



The image shows 14 algebraic fraction cards arranged on a wooden surface. The cards are organized as follows:

$\frac{x+3}{x-2}$	$\frac{x-1}{x+2}$	$\frac{x-1}{x+3}$
$\frac{2x+6}{2x-4}$	$\frac{x^2-x}{x^2+2x}$	$\frac{x^2+3x-4}{x^2+7x+12}$
$\frac{x^2+3x}{x^2-2x}$	$\frac{x^2-1}{x^2+3x+2}$	$\frac{4x-4}{4x+12}$
$\frac{(x+3)^2}{(x^2+x-6)}$	$\frac{x^3-x^2}{x^3+2x^2}$	$\frac{x^2+2x-3}{x^2+6x+9}$
	$\frac{2x^2-2x}{2x^2+4x}$	$\frac{(x+2)(x^2-3x+2)}{(x-2)(x^2+5x+6)}$
	$\frac{(x^2-4x+3)(x+4)}{(x^2+6x+8)(x-3)}$	

We are looking forward.....



To welcoming you to Bourne
Academy Sixth Form to study Maths