

Mathematics Bridging Units

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Introduction

In order to prepare for taking A-level maths next year, you need to ensure you are fluent in all aspects of GCSE maths, particularly algebra and you need to be able to approach problems with a confident, logical mindset.

Success in A-Level Mathematics relies on an excellent attitude to learning and commitment to your studies. Whilst you are completing this transition work, if you struggle with any of the content you need to seek help from website platforms you have used during your studies, [Corbett Maths](#) (no login required) and [Sparx](#) (You would need to have an account already set up by your current school, Ripley students you have one of these).

There are 2 tasks to complete before starting in September, they are outlined on the next pages.

Equipment needed

In addition to the usual equipment you were required to bring during your GCSEs you will need the following:

- 1) A lever arch folder, please note that this is not a normal slim folder but the ones which can hold 100s of pages. They can be purchased from all good supermarkets or online retailers who are named after large South American rivers.
- 2) You will also need 24 A4 dividers. You will be required to keep an organised folder which has a contents page we will provide you with during your 1st lesson. These dividers will help with that and are required.
- 3) A more advance calculator. As part of the A-Level Mathematics and Further Mathematics course students are required to purchase a more powerful calculator that is capable of solving complex equations and is invaluable when working with statistics. There are 3 possible calculators you can choose from, some of you may already have one as they were allowed for your GCSEs.
 - a. [Casio fx-991EX](#): This is an older model which some pupils may have already purchased for their GCSEs. It has been discontinued but can be found on EBay however I would not always trust retailers on there.
 - b. [Casio fx-991CW](#): This is the new version of the calculator above. It does all of the same things and some additional functions as well. They can be found for approximately £25 from supermarkets and stationery shops.
 - c. [Casio FX-CG50](#): A more expensive calculator (approximately £120), it can do a lot of additional functions including drawing graphs which can be of benefit when trying to understand a question. They are allowed in you're A-Level exams in exam mode which stops students creating programs to run on it and wipes its memory.

As a school we will be offering a single chance to purchase either the Casio fx-991CW or the Casio fx -CG50 at a discounted rate. You can wait for this during the first week of school or purchase one yourself over the Summer

Additional resources to help you prepare.

As mentioned above it is important that you start Year 12 with an excellent attitude and be prepared to go above what is necessarily set as independent learning tasks. There are plenty of resources available online, please below for a few extra ideas to help you prepare for A-Level Maths. You can scan the QR codes or click them to take you to the correct pages.

[Bridging the Gap](#)

An A-Level maths tutor who produces videos and online resources. This page gives you the basics and videos with a A-Level spin. We do not recommend paying £95 per hour for the 1-1 tuition.



[AMSP Transition to A-Level Essential Skills](#)

AMSP produce amazing resources and these were designed for students to complete independently and will develop fluency in the fundamental techniques and the key mathematical concepts that underpin A level Mathematics.



[Sparx Maths Transition Booklet](#)

If your school uses SPARX then you can use the codes in the transition booklet. Otherwise this is just additional maths practice linked to the beginnings of A-Level.



[OCRs Bridging the gap](#)

Produced by OCR (an exam board) this is a bit more old school textbook style with examples and exercises. These have some tricky questions which will test your abilities well.



[TL Maths](#)

This person produces very good videos for A-Level maths and he has made a series of bridging videos to help with the transition.



Transition Piece 1

There are 2 Tasks to complete, the first uses an online platform created by Newcastle University. The second uses a website called TL-Maths where you will watch videos and take notes using the pages provided.

Task 1

For your transition we will be using an online course created by Newcastle University. The course is designed to build your confidence and give you some additional practice on key topics to help maximise your chances of success at A-level.

The course will cover the following GCSE topics:

- Session 1 & 2: Simplifying Expressions
- Session 3: Quadratics
- Session 4 & 5: Equations and Inequalities
- Session 6: Graph Transformations
- Session 7 & 8: Linear Equations
- Session 9: Algebraic Fractions
- Session 10: Trigonometry

Each topic will be covered in a pre-recorded video session. An assessment will be set for each topic using Newcastle University's e-learning software "Numbas".

Once you have completed the 10 sessions (They recommend completing 2 a week) you will receive a certificate and a progress report which will give you personalised areas you will need to develop.

You must bring both to your first lesson in September.

Consent

To be able to complete Transition Piece 1 you need to sign up to a Newcastle University Course. You must have given Ripley St Thomas permission to send your **Full Name** to Newcastle University (an email was sent to you in June). If you have not done so already please complete this form:

<https://forms.office.com/e/ybBtj3cPHr>

If you choose not to give permission then you will be sent alternative work to do on paper.

Link to Newcastle University's form to complete

To access the work you must complete this form from Newcastle University, they will ask for your name, personal email address and school (Ripley St Thomas):

<https://bit.ly/GCSEtoALevel2024>

All data held by Newcastle University is deleted in October 2024.

Task 2

Taking notes is a large part of A-Level, you must then be able to apply them to questions. The two topics we have chosen are ones which are seen at GCSE however the A-Level parts are a bit beyond GCSE. There will be times where you are asked to use videos to do some pre-learning before a lesson. This is designed so you can utilise the best resource you have “The Teacher” whilst you are completing actual questions and therefore avoids a lecture style of course.

You can approach this task in 2 different ways, some of you may not require the video links to answer some of the questions. In which case you can go through this and fill it out yourself, showing **FULL WORKING OUT**. If you struggle the video will take you through, step by step, how to do each problem. Where there are multiple questions under a video we would encourage you to at least attempt these first, then look at the video for answers and/or further guidance. All questions should be marked with green pen using the answers from the video.

The topics chosen with form your notes for Chapter 2 – Surds and Chapter 10 – Triangle Geometry from the textbook you will get access to in September. As such make sure they are complete and accurate. We will not look at these 2 chapters again as part of the course because they are just GCSE topics; however you may be assessed on them in your A-Level exams.

During your first lesson your teacher will ask to see the notes you have made, therefore ensure these are completed and marked in green pen. You can either print this off and write straight onto it or complete it on paper.

Chapter 2- Surds

[Video 1](#)

Give 2 examples of a surd



Click or Scan the QR code to take you to a full playlist for this chapter.

Give an example of 2 square root terms which are not surds

How do you simplify

$$\sqrt{8}$$

$$\sqrt{12}$$

Why would using $\sqrt{6} \times \sqrt{2}$ not work?

What is the general rule of simplifying?

[Video 2](#) - Simplifying

1. $\sqrt{18}$

2. $\sqrt{200}$

3. $\sqrt{48}$

4. $\frac{\sqrt{12}}{\sqrt{300}}$

5. $\sqrt{24} \times \sqrt{150}$

[Video 3](#)- Adding/Subtracting Surds

1) $\sqrt{20} + \sqrt{180}$

2) $\sqrt{63} - \sqrt{28}$

3) $\sqrt{108} + \sqrt{72}$

[Video 4](#) – Expanding brackets

$\sqrt{3}(\sqrt{2} + 5)$

[Video 5](#)

1) $6(\sqrt{3} + \sqrt{6})$

2) $\sqrt{5}(8 - \sqrt{7})$

3) $\sqrt{6}(\sqrt{15} - 2\sqrt{2})$

4) $\sqrt{12}(\sqrt{50} + 3\sqrt{10})$

[Video 6](#) – Expanding Double Brackets

$(2 + \sqrt{2})(3 - \sqrt{5})$

[Video 7](#)

1) $(2 - \sqrt{5})(2 + \sqrt{5})$

$$2) (3 + \sqrt{2})(2 + \sqrt{3})$$

$$3) (\sqrt{2} + 1)(\sqrt{3} - \sqrt{5})$$

$$4) (2\sqrt{3} + 3\sqrt{5})(2\sqrt{2} - 3\sqrt{5})$$

[Video 8](#) – Rationalising the Denominator

Why is rationalising the denominator a good idea?

$$\frac{1}{\sqrt{2}}$$

[Video 9](#)

$$1) \frac{2}{\sqrt{3}}$$

$$2) \frac{10}{\sqrt{5}}$$

$$3) \frac{9}{2\sqrt{3}}$$

[Video 10](#)

$$\frac{1}{1 + \sqrt{2}}$$

What would multiplying by $\frac{1+\sqrt{2}}{1+\sqrt{2}}$ not work?

What mathematical property are you utilising here to eliminate the Surds from the denominator?

[Video 11](#)

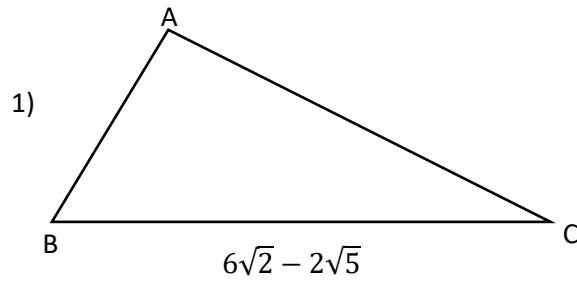
1) $\frac{2}{\sqrt{2}+2}$

2) $\frac{3}{4-\sqrt{5}}$

3) $\frac{1+\sqrt{2}}{3-\sqrt{2}}$

4) $\frac{4+2\sqrt{3}}{3+3\sqrt{2}}$

[Video 12](#)



ΔABC has area 5. Find the exact perpendicular height of the triangle

- 2) Rationalise the denominator of $\frac{1}{\sqrt{2} + \sqrt{3} - \sqrt{5}}$

[Video 13](#)

Solve $x\sqrt{2} + 5 = x - \sqrt{2}$

[Video 14](#)

Solve:

1) $\sqrt{2}(x - 3) = 4(x + \sqrt{2})$

$$2) \quad x - \sqrt{48} = 2\sqrt{3} - 2x$$

$$3) \quad x\sqrt{18} - 4 = \sqrt{8}$$

$$4) \quad x\sqrt{5} + 2 = \sqrt{20}(x - 1)$$

[Video 15](#)

Find the exact coordinates of intersection of the two lines:

$$y = \sqrt{2}x + \sqrt{3} - 2$$

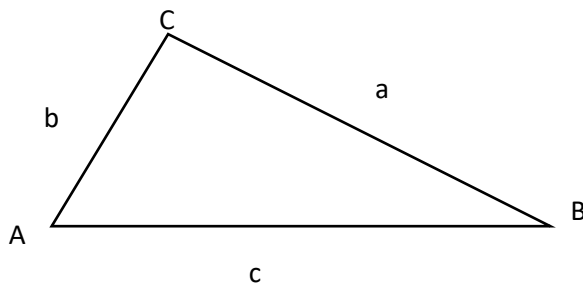
$$y = \sqrt{3}x + \sqrt{3} - \sqrt{6}$$

[Video 16](#)

Prove that $\frac{1}{3\sqrt{2}-4} > 2$

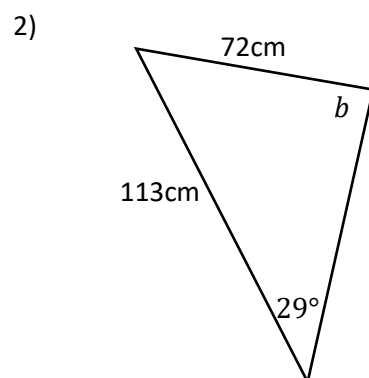
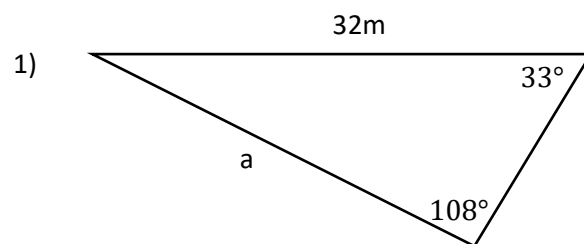
Chapter 11 - Triangle Geometry

[Video 1](#)-Proof of Sine Rule

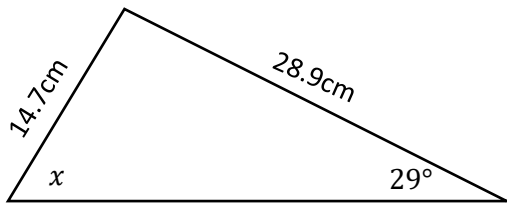


Click or Scan the QR to take you to a full playlist for the videos (you will need to skip the 1st 6 videos)

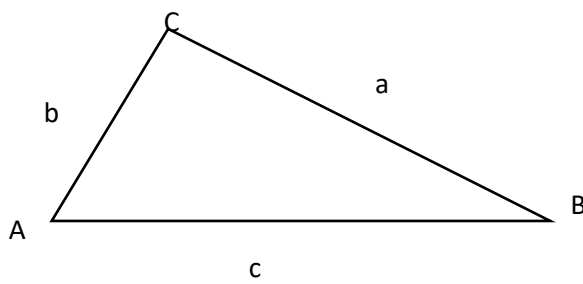
[Video 2](#)-Using the Sine Rule



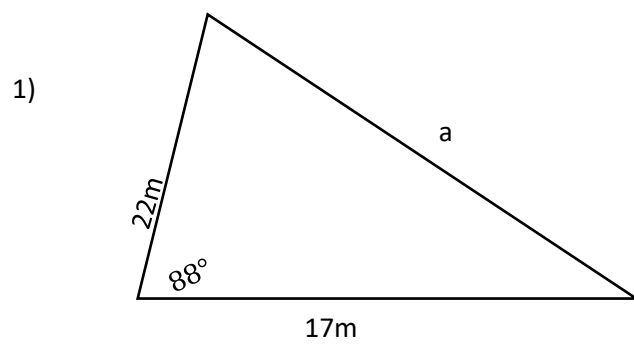
[Video 3](#) – Two triangles



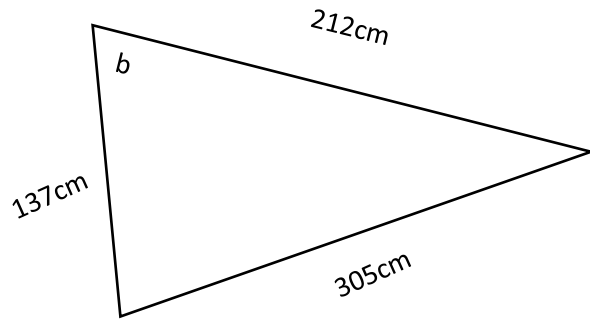
[Video 4](#) – Proof of Cosine Rule



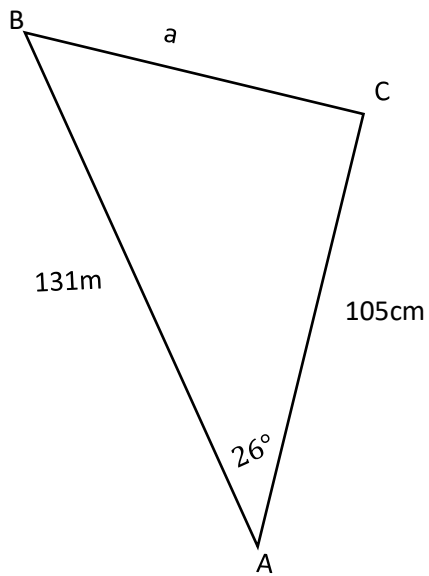
[Video 5](#) – Using the Cosine Rule



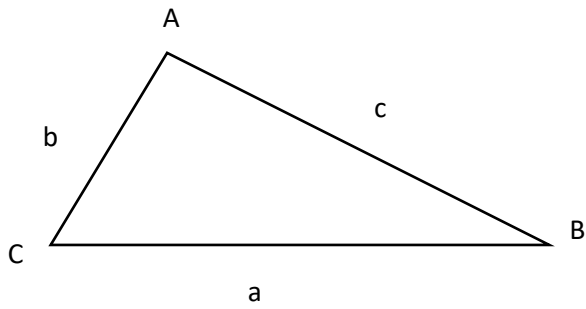
2)



[Video 6](#) Find all the missing sides and angles of a triangle



[Video 7](#)-Proof of area of a triangle



[Video 8](#)- finding the area of triangles

