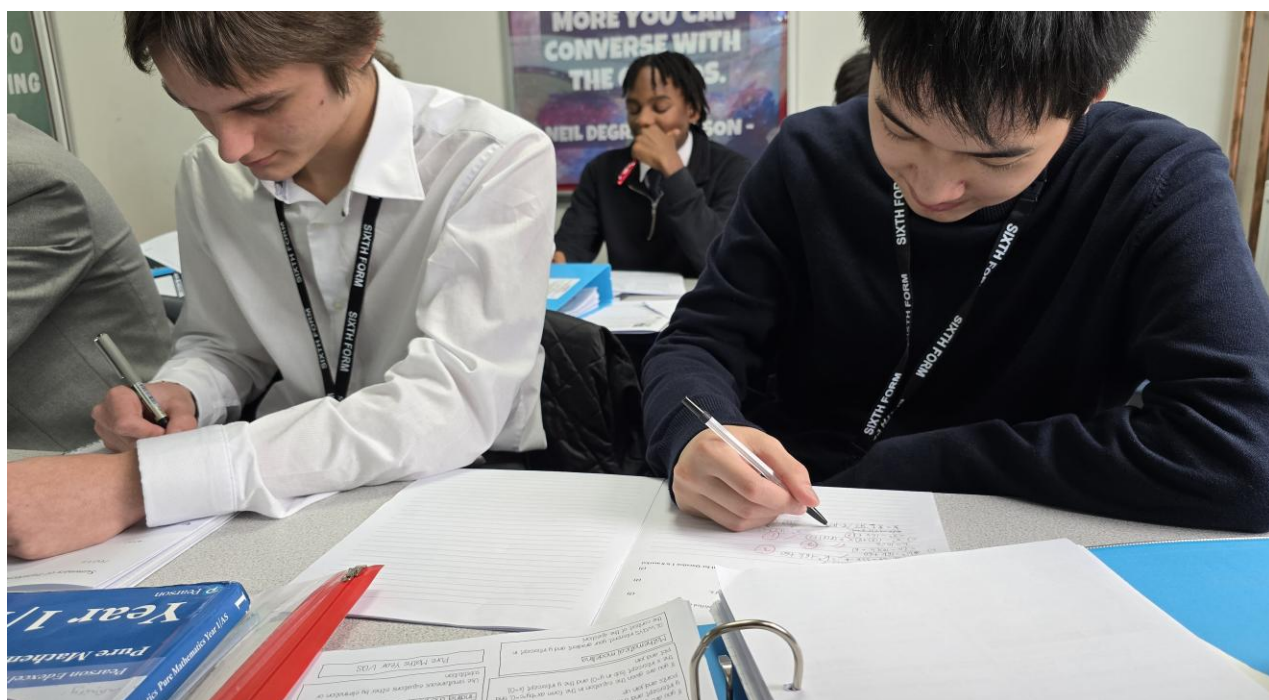


The Friary Sixth Form



A-Level Mathematics Bridging Pack 2026

Introduction



A Level Mathematics is well suited to students who enjoy solving problems, thinking logically, and working with numbers. Successful mathematicians are often curious, resilient, and willing to persevere when faced with challenging questions. Strong analytical skills, attention to detail, and the ability to approach problems systematically are valuable qualities, while a willingness to practise and learn from mistakes is equally important.

Studying A Level Mathematics develops highly transferable skills, including critical thinking, data analysis, modelling, and problem-solving. These skills are valued by universities and employers across a wide range of fields. Mathematics can lead to careers in engineering, finance, economics, computer science, data science, actuarial work, and scientific research, while also supporting progression into subjects such as physics, business, and medicine. As a respected and versatile qualification, A Level Mathematics keeps many future study and career options open.

Here at the Friary, you will be supported by an experienced team of teachers. Between us, we have many years of A-Level teaching experience. We also have exam markers in the department so we can give you extra insight into exam technique.

Your A-Level teachers will always be happy and willing to help. As well as lessons, extra clinics and masterclasses will further support your study. Teachers are supportive and approachable. We have established a community feel in A-Level Maths, where students work together to provide help and enhance each other's understanding.

Our course is composed of a well-structured order of topics with assessments and feedback at regular checkpoints. The course is programmed to prepare you as well as possible to understand and master the topics and moreover, to be in a position to apply these successfully in the assessments.

The course consists of Pure Mathematics, Statistics and Mechanics. This gives you a rounded understanding of mathematics and its applications. We aim to teach these in an engaging manner in order that you might find your learning an enjoyable experience that enhances your knowledge and application.

There may be occasions when you need extra support in particular areas. We carefully monitor your progress to help you recognise these areas and facilitate you in addressing your targets.

If you have any questions about studying Mathematics at the Friary, then ask one of our teachers or chat to our current sixth formers. It's a challenging but rewarding subject. The number of students who turn up to our many after school sessions pays testament to the enthusiasm running through the Friary A-Level Maths community.

Course Expectations



This pack contains a programme of activities and resources to prepare you to start your A-Level Mathematics course in September. It is aimed to be used after you complete your GCSEs, throughout the remainder of the summer term and over the summer holidays to ensure you are ready to start your new course in September.

The course coordinators for this qualification are:

Mr Simpson (jsimpson@friaryschool.co.uk)

Dr Buxton (dbuxton@friaryschool.co.uk)

What we expect from you

- Excellent attendance/punctuality to lessons
- Correct equipment (see list on next page)
- Correct uniform – smart business wear and lanyard to be always worn
- Meet deadlines
- Contribute positively to lessons

What you can expect from us

- High quality teaching and learning
- Commitment to you as individuals
- Constant support and guidance
- Weekly after school booster/masterclass sessions
- Submitted work will be marked and assessed within 10 days of handing it in

Equipment List



Essential classroom equipment

- Scientific calculator (approved model, e.g. **Casio fx-991EX** or **fx-991CW**)
- Ruler (30 cm, preferably clear plastic for accuracy)
- Pencil (HB for diagrams and working)
- Eraser (for corrections in working)
- Sharpener
- A4 folders (4 in total over two years of study)
- A4 notepad (preferably small squared but lined is acceptable)
- Plastic wallets (for each folder)
- Folder dividers (for each folder)
- Textbooks (provided)

Highly recommended items

- Graph paper (for accurate plotting of functions and data)
- Coloured pens or pencils (to distinguish lines, graphs, or steps)
- Mathematical set (often includes ruler, compass, protractor, set squares)
- Highlighters (for key steps in revision or exam questions)

Optional but useful

- Graphing software or apps (for visualising functions, e.g. Desmos)
- Whiteboard and pens (for practising questions at home)
- Sticky notes (for formulae or key reminders)
- Graphing calculator (has more functionality but is not mandatory, model number **fx-CG100**)

Course Overview



A Level Mathematics (Edexcel 9MA0) – Course Summary

Exam board: Pearson Edexcel

Qualification: A Level Mathematics (Level 3 Advanced GCE)

Specification code: 9MA0

Linear course: All exams taken at the end of Year 13

The course is split into:

- Pure Mathematics (2/3 of content)
- Statistics & Mechanics (1/3 of content)

Across all content, students develop:

- Mathematical reasoning and proof
- Problem-solving skills
- Mathematical modelling of real-world situations

Topic Breakdown (chapters/content)

Pure Mathematics (Papers 1 & 2)

These two papers cover the full Pure content:

- Proof
- Algebra and functions
- Coordinate geometry (x–y plane)
- Sequences and series (including binomial expansion)
- Trigonometry (identities and equations)
- Exponentials and logarithms
- Differentiation (including applications)
- Integration (including advanced methods)
- Numerical methods
- Vectors (2D and 3D)

Statistics (Paper 3 – Section A)

- Statistical sampling
- Data presentation and interpretation
- Probability
- Statistical distributions (binomial, normal, etc.)
- Hypothesis testing

Focus: interpreting data and making conclusions from samples.

Mechanics (Paper 3 – Section B)

- Quantities and units in mechanics
- Kinematics (motion: displacement, velocity, acceleration)
- Forces and Newton's laws
- Moments

Focus: applying maths to physical systems and motion.

Exam structure – Papers

There are 3 exam papers:

Paper 1 – Pure Mathematics 1

2 hours

100 marks

33.3% of total grade

Paper 2 – Pure Mathematics 2

2 hours

100 marks

33.3% of total grade

Paper 3 – Statistics & Mechanics

2 hours

100 marks

33.3% of total grade

Total assessment

3 exams

300 marks total

100% exam-based (no coursework)

- Calculator allowed in all papers
- Formula booklet provided in exams
- Strong emphasis on problem-solving rather than memorisation

Key things to know before starting

1) Strong GCSE foundation is essential

Students should be confident with:

- Algebra manipulation
- Graphs and functions
- Trigonometry basics
- Probability and statistics basics

2) The course is heavily cumulative

Topics build on each other, especially in:

- Algebra → calculus
- Trigonometry → integration/differentiation
- Statistics → distributions and hypothesis testing

3) Problem-solving is more important than routine methods

Many questions:

- Combine multiple topics
- Require interpretation, not just calculation
- Test reasoning under unfamiliar contexts

4) Applied maths is concept-heavy

- Mechanics = physics-style reasoning
- Statistics = interpreting real data and probability models

Progression and relevance

A Level Maths is highly valued and supports progression into:

- Engineering
- Physics
- Computer Science
- Economics
- Data Science
- Finance and Actuarial Science
- Mathematics degrees

It is considered one of the most useful A Levels for university and employment pathways involving analytical thinking.

Tasks



In order to prepare for studying A-Level Mathematics at the Friary School, we have provided the following practice questions.

These should be completed and brought to your first lesson.

If you have any questions about these tasks, please feel free to email me on dbuxton@friaryschool.co.uk.

Good luck!

Dr D Buxton

Coordinator of A-Level Mathematics and Further Mathematics

Q1

Expand and fully simplify $(2\sqrt{6} - 5\sqrt{2})^2$

Answer:

Q2

Rationalise the denominator of $\frac{15 + \sqrt{3}}{10\sqrt{3}}$

Give your answer as a fraction in its simplest form.

Answer:

Q3

Rationalise the denominator of $\frac{2\sqrt{7}}{3+\sqrt{7}}$

Give your answer in its simplest form.

Answer:

Q4

Write $\sqrt{12} + \frac{33}{\sqrt{3}}$ in the form $r\sqrt{3}$, where r is an integer.

Answer:

Q1

Expand and fully simplify $2(4d + 5)(3d + 1)$

Answer:

Q2

Expand and fully simplify $(x + 1)(x^2 + 3x + 5)$

Answer:

Q3 Expand and fully simplify $(3n + 4)(5n + 2) + 5(n + 7)$

Answer:

Q4 Expand and fully simplify $(t - 2)(t + 5)(t - 4)$

Answer:

Q1

Fully factorise $x^2 - 16$

Answer:

Q2

Fully factorise $2r^2 + 15r + 7$

Answer:

Q3

Fully factorise $5x^2 + 22x + 8$

Answer:

Q1

Write $\frac{(3a)^2}{54ak}$ as a fraction in its simplest form.

Answer:

Q2

Fully simplify $(64g^8h^4)^{\frac{1}{2}}$

Answer:

Q3

Fully simplify $\frac{x+2}{2x^2-31x-70}$

Answer:

Q1

Fully simplify $\frac{2}{5a+4} \times \frac{45a+36}{a}$

Give your answer as a fraction.

Answer:

Q2

Fully simplify $\frac{6x}{(5x-7)(x+1)} - \frac{1}{5x-7}$

Give your answer fully factorised.

Answer:

Q3 Write the following as a single fraction in its simplest form:

$$\frac{2x^2 - 11x + 12}{x + 5} \div (4x^2 - 6x)$$

Give your answer fully factorised.

Answer:

Q4 Fully simplify $\frac{4ab^2}{k} \times \frac{3ak}{12k} \times \frac{7}{5ab}$

Give your answer as a fraction.

Answer:

Q1

Using the quadratic formula, solve $y^2 - 6y + 7 = 0$

Give your answer in the form $a \pm \sqrt{b}$

Answer:

Q2

Solve the equation below using factorising.

$$6y^2 - 11y - 10 = 0$$

Answer:

Q3 Using the quadratic formula, solve $6x^2 - 35 = -11x$

Answer:

Q4 Solve $3r(3r - 4) = 2$
Give your answers to 2 d.p.

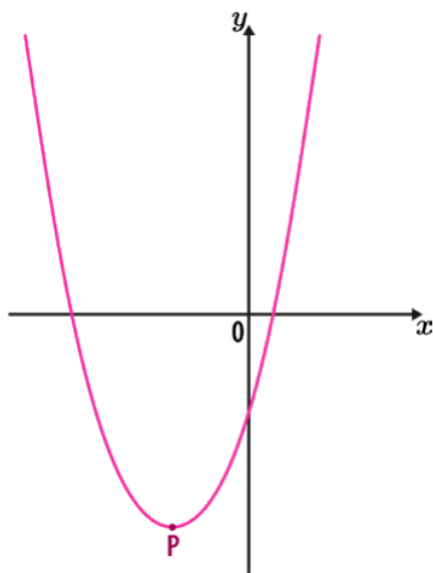
Answer:

Q1

The diagram below shows a sketch of the curve $y = x^2 + 8x - 10$

P is the turning point of the curve.

Work out the coordinates of P.



Answer: (..... ,)

Q2

Work out the coordinates of the turning point of the curve $y = x^2 - 5x + 1$

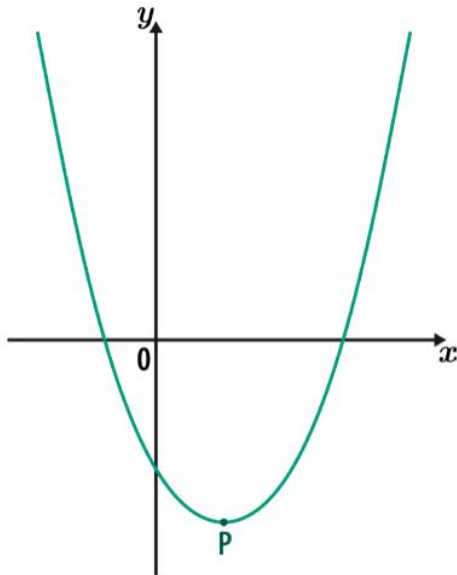
Answer: (..... ,)

Q3

The diagram below shows a sketch of the curve $y = 3x^2 - 6x - 10$

P is the turning point of the curve.

Work out the coordinates of P.



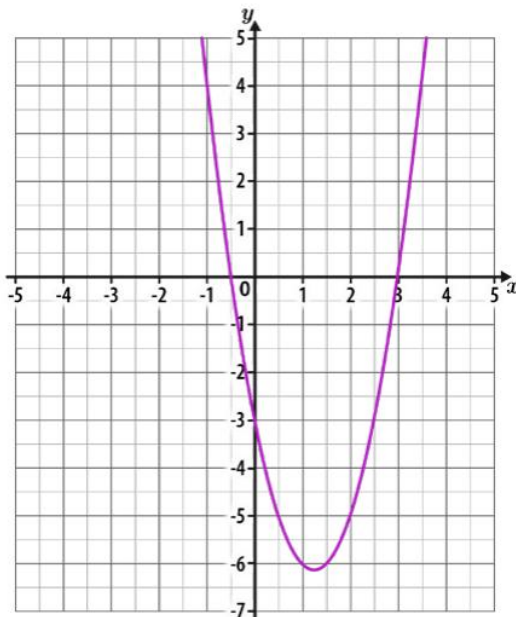
Answer: (..... ,)

Q4

The diagram below shows the graph of $y = 2x^2 - 5x - 3$

Use the diagram to estimate the solutions to $2x^2 - 5x - 3 = -2x + 2$

Give any decimal answers to 1 d.p.



Answer:

Q1

Solve the following simultaneous equations:

$$7x + 5y = 8$$

$$3x - 2y = -9$$

Answer: $x = \dots\dots\dots$ $y = \dots\dots\dots$

Q2

Solve the following simultaneous equations:

$$6x + 7y = 5$$

$$9x + 13y = -10$$

Answer: $x = \dots\dots\dots$ $y = \dots\dots\dots$

Q3

Solve the following simultaneous equations:

$$7y + 2x = \frac{23}{2}$$

$$5y + 3x = 9$$

Answer: $x = \dots\dots\dots$ $y = \dots\dots\dots$

Q4

Solve the following simultaneous equations:

$$4.6t + 8.1u = 104$$

$$3.8t - 2.7u = -8$$

Answer: $t = \dots\dots\dots$ $u = \dots\dots\dots$

Q1

A straight line has a gradient of $-\frac{3}{4}$, and passes through the point (32, 12)

Work out the equation of the line.

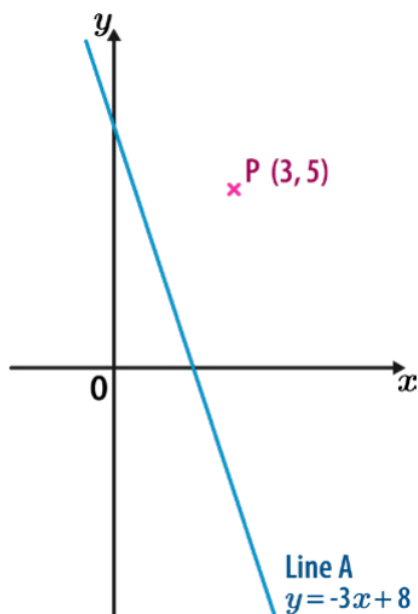
Answer:

Q2

The diagram below shows point P and Line A.

Line B is **perpendicular** to line A and passes through point P.

What is the equation of line B?



Answer:

Q3

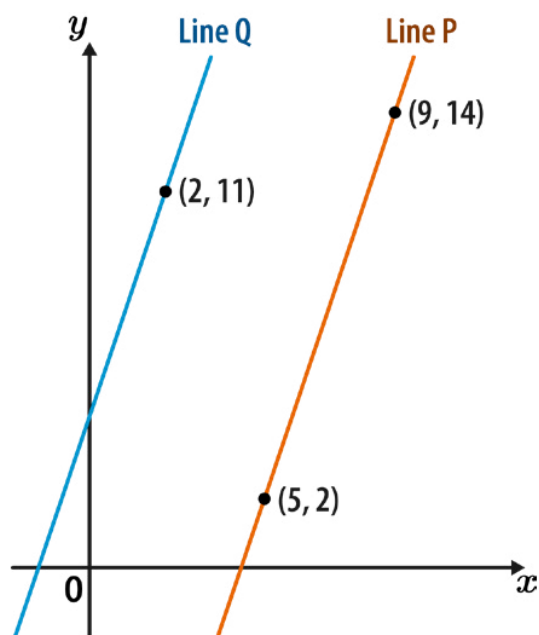
Work out the equation of the straight line that passes through $(1, -7)$ and $(6, 8)$

Answer:

Q4

The graph below shows line P and line Q.
Line Q is **parallel** to line P.

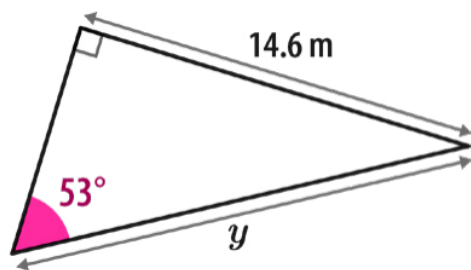
What is the equation of line Q?



Answer:

Q1

Calculate the length y .
Give your answer to 2 d.p.

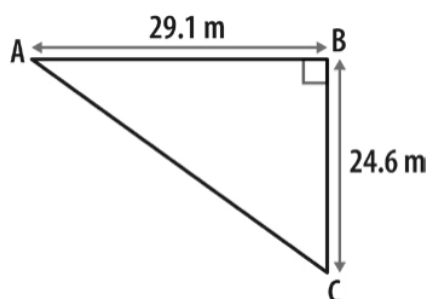


Not drawn accurately

Answer: m

Q2

Calculate the size of angle BAC.
Give your answer to 1 d.p.

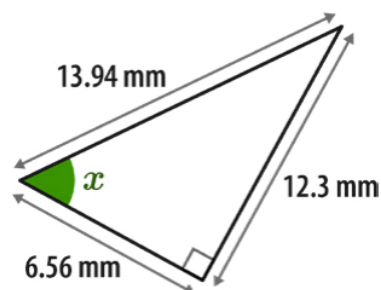


Not drawn accurately

Answer: °

Q3

What is the size of angle x ?
Give your answer to 1 d.p.

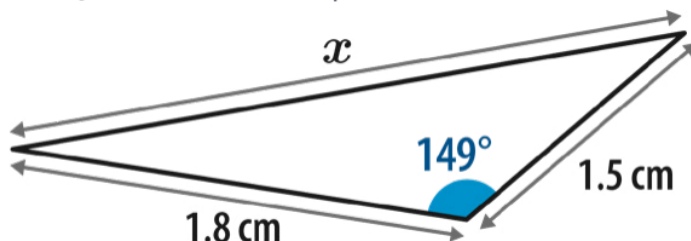


Not drawn accurately

Answer: °

Q1

Work out length x .
Give your answer to 1 d.p.

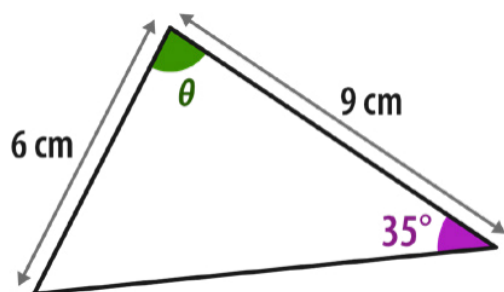


Not drawn accurately

Answer: cm

Q2

All the angles in the triangle below are acute.
Calculate the angle θ to 1 d.p.



Not drawn accurately

Answer: $^\circ$

Glossary



These command words are used consistently across Edexcel A Level Mathematics and Further Mathematics papers. Understanding them is important because they determine the depth of working required and the type of response expected for marks.

Calculate – Work out the value using appropriate methods.

Complete – Fill in missing values or steps in given work.

Determine – Find a value using reasoning or calculation.

Evaluate – Find the numerical value of an expression.

Explain – Give mathematical reasons for a result or method.

Find – Obtain the required value or expression.

Hence – Use a previous result to reach a further conclusion.

Hence or otherwise – Use prior result or an alternative valid method.

Identify – Recognise and state the correct answer from information given.

Interpret – Explain the meaning of a result in context.

Prove – Provide a full logical argument showing a statement is always true.

Show that – Demonstrate a given result using clear mathematical working.

Simplify – Rewrite an expression in its most basic form.

Solve – Find values that satisfy an equation or inequality.

State – Give an answer with no working required.

Verify – Check that a result is correct, usually by substitution.

Write down – Give the answer directly, usually without working.

Additional Reading



1. **Humble Pi – *Matt Parker*** A humorous and accessible look at what happens when mathematics goes wrong in the real world, from engineering mishaps to everyday errors.
2. **Things to Make and Do in the Fourth Dimension – *Matt Parker*** Explores fascinating mathematical ideas through puzzles, shapes, codes, and surprising real-world applications.
3. **Alex's Adventures in Numberland – *Alex Bellos*** A highly engaging journey through the world of numbers, featuring mathematical curiosities, stories, and cultures from around the globe.
4. **Can You Solve My Problems? – *Alex Bellos*** A collection of mathematical puzzles and brain teasers that develops logical thinking and problem-solving skills.
5. **The Simpsons and Their Mathematical Secrets – *Simon Singh*** Reveals the hidden mathematics woven into one of the world's most famous television shows.
6. **Fermat's Last Theorem – *Simon Singh*** Tells the remarkable story of one of mathematics' greatest unsolved problems and the centuries-long quest to solve it.
7. **The Number Devil – *Hans Magnus Enzensberger*** A creative and entertaining introduction to mathematical ideas presented through a series of imaginative dreams.
8. **How Long Is a Piece of String? – *Rob Eastaway and Jeremy Wyndham*** Demonstrates how mathematics appears in everyday life through practical questions and intriguing examples.
9. **Infinite Powers – *Steven Strogatz*** Explains how mathematical ideas, particularly calculus, have shaped science, technology, and our understanding of the world.
10. **The Art of Statistics – *David Spiegelhalter*** An accessible introduction to how data and statistics are used to understand the world, particularly relevant to modern mathematical study.

Optional Challenge Reads

- The Man Who Loved Only Numbers – *Paul Hoffman*
- Gödel, Escher, Bach – *Douglas Hofstadter* (for highly ambitious readers)
- The Music of the Primes – *Marcus du Sautoy*
- Hello World – *Hannah Fry*

Supporting Resources



- You will be provided with the relevant textbooks for the Edexcel A-Level published by Pearson
- The required calculator for the A-Level Maths course is the **Casio fx-991EX** or **Casio fx-991CW** scientific calculator (**Casio fx-CG100** is optional)
- There are supplementary texts available. We recommend the CGP revision guides and workbooks. There will be opportunities to purchase these through the school.
- A very useful website to discover/consolidate A level topics is Mr Bicen's YouTube channel: www.youtube.com/@BicenMaths.