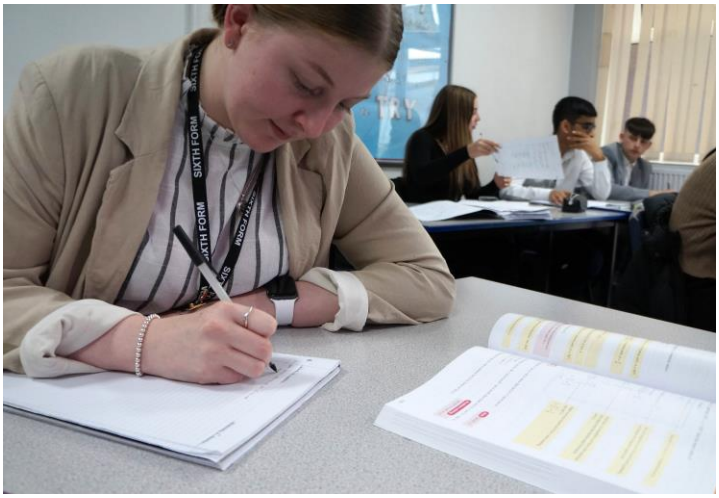
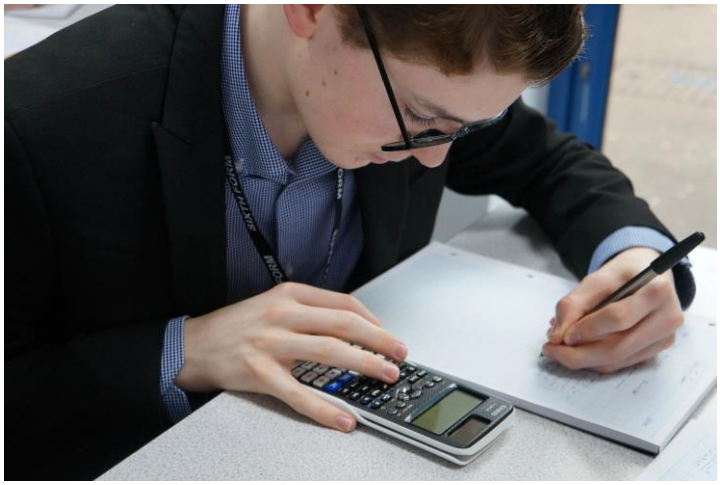
The Friary Sixth Form





A-Level Mathematics Bridging Pack 2025

Course Expectations

Introduction

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 coordinator for this qualification is Mr Thorpe – jthorpe@friaryschool.co.uk

What we expect from you?

- Excellent attendance/punctuality to lessons
- Correct equipment (see list below)
- Correct uniform – smart business wear and lanyard to be worn at all times
- Meet deadlines
- Contribute positively in 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/revisions sessions
- Submitted work will be marked and assessed within 10 days of handing it in

Equipment list

- The recommended calculator for the A-Level Maths course is the, 'CASIO FX-991EX Scientific Calculator'
- A4 folders (x 4 in total for the two years of study)
- A4 note pad (Preferably small squared but lined is acceptable)
- Plastic wallets (for each folder)
- Folder dividers (for each folder)
- Textbooks (provided)
- Pens, pencils, highlighters, rulers

Course Overview

Edexcel – Mathematics A-Level

The information provided is taken from the Edexcel specification document

Content and assessment overview

The Pearson Edexcel Level 3 Advanced GCE in Mathematics consists of three externally-examined papers. Students must complete all assessment in May/June in any single year.

Pure Mathematics Components

Paper 1: Pure Mathematics 1 (*Paper code: 9MA0/01)
Paper 2: Pure Mathematics 2 (*Paper code: 9MA0/02)

Each paper is:

2-hour written examination
33.33% of the qualification
100 marks

Content overview

● Topic 1 – Proof
● Topic 2 – Algebra and functions
● Topic 3 – Coordinate geometry in the (x, y) plane
● Topic 4 – Sequences and series
● Topic 5 – Trigonometry
● Topic 6 – Exponentials and logarithms
● Topic 7 – Differentiation
● Topic 8 – Integration
● Topic 9 – Numerical methods
● Topic 10 – Vectors

Assessment overview

● Paper 1 and Paper 2 may contain questions on any topics from the Pure Mathematics content.
● Students must answer all questions.
● Calculators can be used in the assessment.

Applied Mathematics Components

Paper 3: Statistics and Mechanics (*Paper code: 9MA0/03)

This paper is:

2-hour written examination
33.33% of the qualification
100 marks

Content overview

Section A: Statistics
● Topic 1 – Statistical sampling
● Topic 2 – Data presentation and interpretation
● Topic 3 – Probability
● Topic 4 – Statistical distributions
● Topic 5 – Statistical hypothesis testing
Section B: Mechanics
● Topic 6 – Quantities and units in mechanics
● Topic 7 – Kinematics
● Topic 8 – Forces and Newton's laws
● Topic 9 – Moments

Assessment overview

● Paper 3 will contain questions on topics from the Statistics content in Section A and Mechanics content in Section B.
● Students must answer all questions.
● Calculators can be used in the assessment.

A-Level Maths at the Friary

Welcome to A-Level Maths at the Friary. Studying Maths at A-Level is an excellent opportunity to further indulge in your love for the subject, whilst gaining a prestigious A-Level that can open many doors to further education and employment.

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

Your A-Level teachers will always be happy and willing to help. As well as lessons, the extra clinics and boosters 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 others' understanding.

Our course is composed of a well-structured order of topics with assessment 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 sixth formers. It's a challenging subject but it's a rewarding experience. 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.

In order to prepare for studying A-Level mathematics at the Friary School, we have provided the following

practice questions .

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 jthorpe@friaryschool.co.uk.

Good luck

Mr J Thorpe

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 $\dfrac{15 + \sqrt{3}}{10\sqrt{3}}$

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 $3r(3r - 4) = 2$

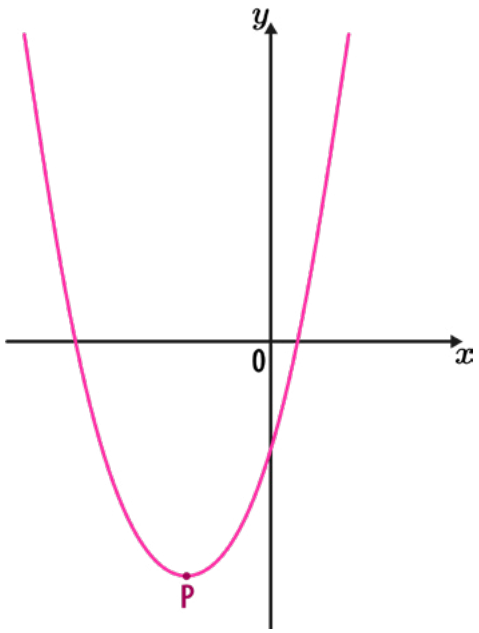
Give your answers to 2 d.p.

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: (..... , ...)

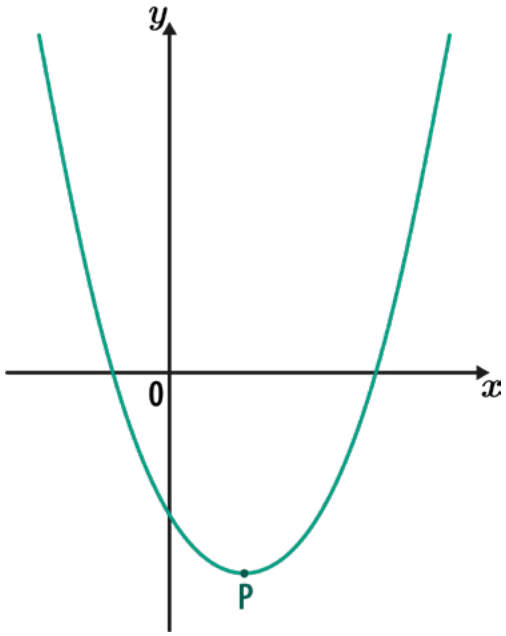
Q2 Work out the coordinates of the turning point of the curve $y = x^2 - 5x + 1$

Answer: (..... , ...)

Q3 The diagram below shows a sketch of the curve $y = 3x^2 - 6x - 10$

P is the turning point of the curve.

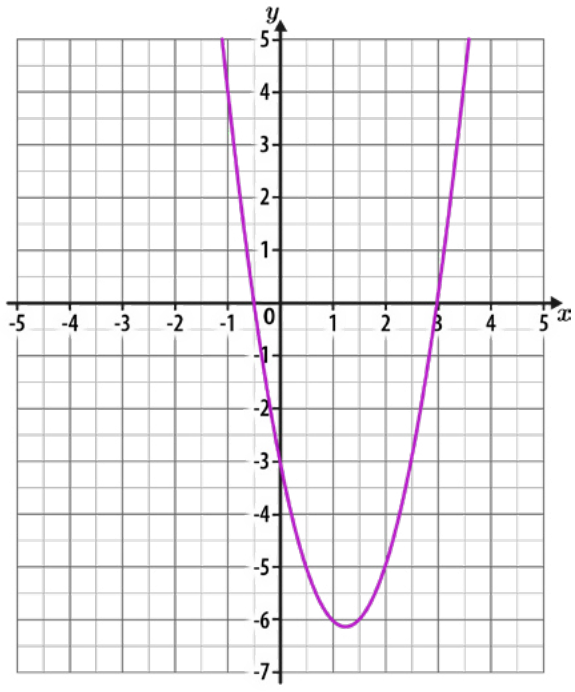
Work out the coordinates of P.



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: $x =$ ..... $y =$ .....

Q2 Solve the following simultaneous equations:

$6x + 7y = 5$

$9x + 13y = -10$

Answer: $x =$ ..... $y =$ .....

Q3 Solve the following simultaneous equations:

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

$5y + 3x = 9$

Answer: $x =$ ..... $y =$ .....

Q4 Solve the following simultaneous equations:

$4.6t + 8.1u = 104$

$3.8t - 2.7u = -8$

Answer: $t =$ ..... $u =$ .....

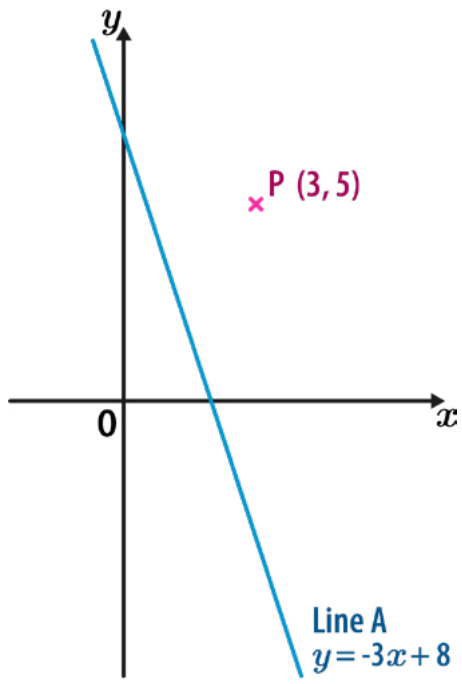
Q1 A straight line has a gradient of $-\frac{3}{4}$, and passes through the point (32, 12)

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?



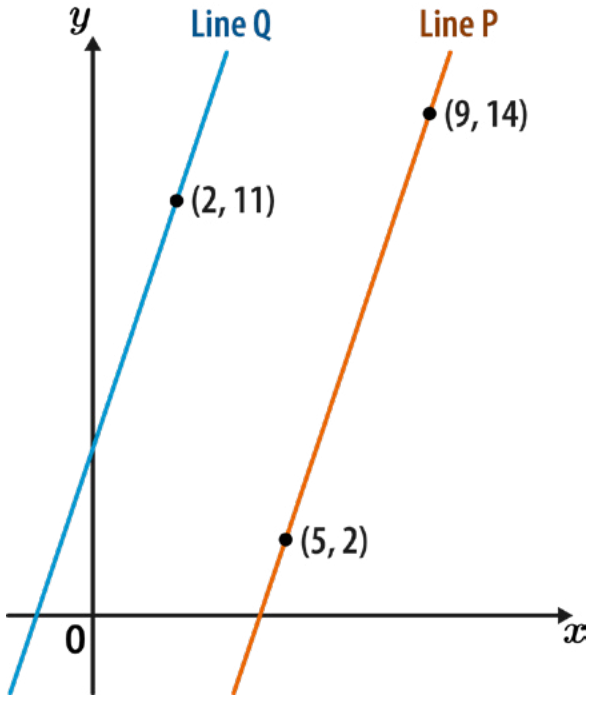
Answer: .....

Q3 Work out the equation of the straight line that passes through (1, -7) and (6, 8)

Answer: .....

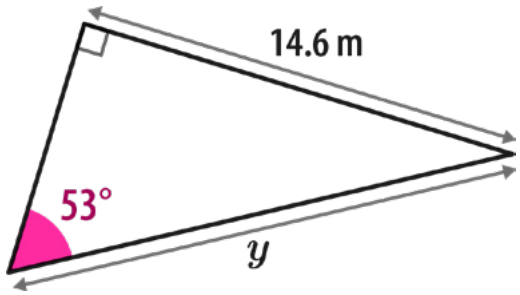
Q4 The graph below shows line P and line Q.
Line Q is **parallel** to line P.

What is the equation of line Q?



Answer: .....

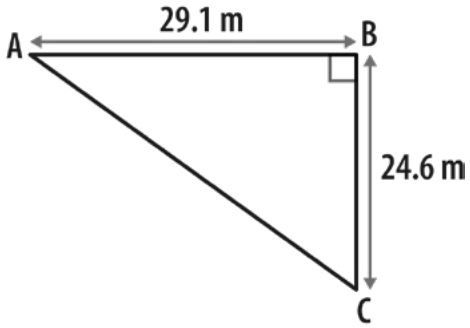
Q1 Calculate the length y.
Give your answer to 2 d.p.



Not drawn accurately

Answer: ..... m

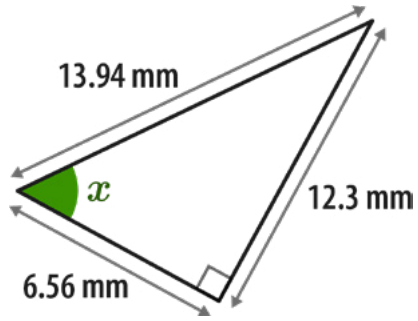
Q2 Calculate the size of angle BAC.
Give your answer to 1 d.p.



Not drawn accurately

Answer: ..... °

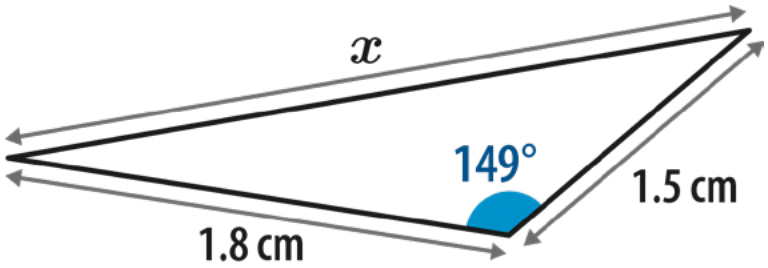
Q3 What is the size of angle x?
Give your answer to 1 d.p.



Not drawn accurately

Answer: ..... °

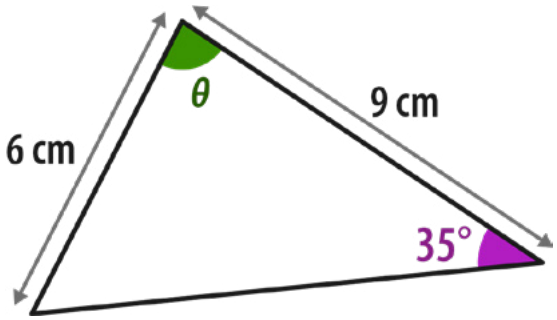
Q1 Work out length x.
Give your answer to 1 d.p.



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: ..... °

Glossary

The following terms are used in questions and assessments. It is essential that you familiarise yourself with them.

Exact - An exact answer is one where numbers ARE NOT given in rounded form. The answer will often contain an irrational number such as √3, e or π and these numbers should be given in that form. Rigorous (exact) working is expected in the answer to the question.

Hence - When a question uses the word 'hence' it is an indication that the next step should be based on what has gone before. You should start from this statement. Where the phrase "Hence or otherwise" is used, this indicates that whilst the previous work could form the starting point of the solution, learners may be aware of, and could use, an equally valid alternate method.

Show that - Show a result is true. Because you're given the result, your explanation has to be sufficiently detailed to cover every step of your working.

Prove - Provide a formal mathematical argument to demonstrate validity

Verify - Substitute given values to demonstrate the truth of a statement.

Sketch - Draw a diagram, not necessarily to scale, showing the main features of a curved graph.

Find, solve, calculate - While working may be necessary to answer the question, no justification needs to be given for any results found.

Show detailed reasoning - Give a solution that leads to a conclusion showing a detailed and complete analytical method. Your solution should contain sufficient detail to allow the line of your argument to be followed. This is not a restriction on use of a calculator when tackling the question.

Determine - Justification should be given for any results found, including working where appropriate.

Draw - Draw to an accuracy appropriate to the problem. You are being asked to make a sensible judgement about this.

Additional Reading

As a student who is choosing to study Mathematics at A Level, it is logical to assume that you have an interest in the subject.

With that said, the following books may be of interest to you. These are books that are not directly linked to the course but allow you to further your mathematical intrigue and understanding.

50 Mathematical Ideas You Really Need to Know (Tony Crilly)
Alex's Adventures in Numberland (Alex Bellos)
Cabinet of Mathematical Curiosities (Ian Stewart)
The Calculus Wars **(**Jason Socrates Bardi)
The Code Book (Simon Singh)
The Curious Incident of the Dog in the Night-time by Mark Haddon
How Many Socks Make a Pair?: Surprisingly Interesting Maths (Rob Eastway)
Hello World: How to be Human in the Age of the Machine (Hannah Fry)
Humble Pi: A Comedy of Maths Errors (Matt Parker)
The Life-Changing Magic of Numbers (Bobby Seagull)
The Num8er My5teries (Marcus du Sautoy)

Supporting Resources

- You will be provided with the relevant text books for the Edexcel A-Level published by Pearson
- The recommended calculator for the A-Level Maths course is the, 'CASIO FX-991EX Scientific Calculator'
- There are supplementary texts available. We recommend the CGP revision guides and workbooks. There will be opportunities to purchase these through the school.