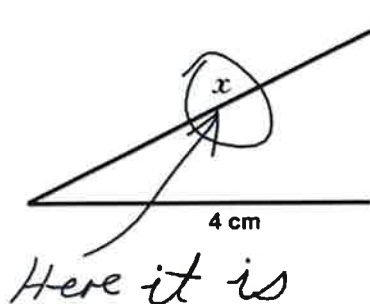*'Mistakes are the portals to Discovery' James Joyce*

Parents Guide to helping your child with Higher Maths
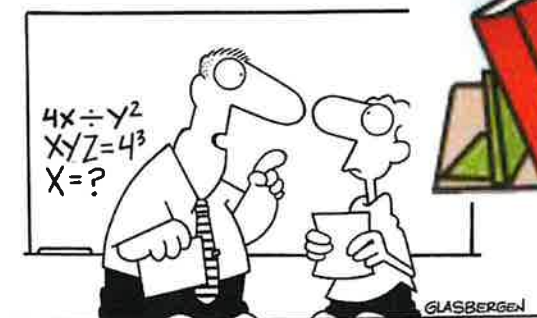

"The essence of mathematics is not to make simple things complicated, but to make complicated things simple." S. Gudder

3. Find x.

"Arithmetic is being able to count up to twenty without taking off your shoes" M. Mouse

'Mistakes are the portals to Discovery' James Joyce

Help Your Child With Higher Maths

Introduction

We've designed this booklet so that you can use it with your child throughout the session, as he/she moves through the Higher course, in order to help them remember key facts and methods. There are separate sections covering the three units of the Higher, as well as one on Credit/Intermediate 2 revision. Obviously there's no point trying to revise Unit 3 work when your child hasn't yet covered it in class, so it's worth giving a rough timetable for the course:

Unit 1 is typically completed by mid-October
Unit 2 is typically completed by January
Unit 3 is typically completed by April
(The section on Credit/Intermediate 2 revision is fair game at any time of the course – your child should already know it all!)

The booklet is not an exhaustive summary of the content of the Higher – a separate booklet is available for that, should you wish to read it! – nor is it meant to replace the set of much more detailed Higher notes which your child should be building up over the session. But the booklet does summarise the key facts and methods which your child will need to be familiar with, if they are to have a chance of passing the Higher. Regular revision of these facts and methods will pay real dividends: it is much better to continually revise throughout the year, than to attempt to "cram" it all in at the last minute.

How to use the booklet

Your child could use this booklet on their own, but we think it would be much better if they had someone else to "test" them on the content. Basically, all you have to do is read out the question on the left-hand column of the page, and all they have to do is give the correct answer (more or less) which is shown on the right. If you prefer, you could simply show your child the answer and ask them what they think the question is.

So by the end of Unit 1 (mid-October), for example, you could test your child on the entire Unit 1 content. However we think it's much better to revise more regularly than that, so we'd suggest that you find out from your child which section they are on (or have already completed) and test them on that, at reasonably regular intervals. If you can do this then you will be making a real contribution to your child's knowledge of the course. In a sense, you will be helping them to remember their "lines" for the performance that will be the Higher Mathematics examination.

If you lack confidence in maths yourself

Don't worry! We have tried to explain the terminology and notation as we go along, but if you are in doubt, then either simply show the question to your child instead or ask them to explain to you how to say it. You may find that some of your child's answers differ slightly from what is here: this may not necessarily mean that they are wrong, as different teachers will naturally teach things in slightly different ways. If in doubt, check with your child. If still in doubt, please feel free to get in touch with us at the school.

Thanks in advance for your help, and good luck!

Revision from Credit/Intermediate 2	
What is the Sine Rule?	$\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$
What is the Cosine Rule?	$a^2 = b^2 + c^2 - 2bc\cos A$
What is the formula for the area of a triangle?	$Area = \frac{1}{2}ab\sin C$
How do you solve a quadratic equation?	Make one side zero, then factorise the other (or use the quadratic formula)
How do you factorise a quadratic?	Look for: 1. Common factor 2. Difference of squares 3. Double brackets
What is the quadratic formula?	$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
How do you find the solution to a simple trig equation, with solutions from 0 to 360 degrees?	Find the acute angle then use an ASTC diagram to find the solutions (usually two)
How do you write $\sqrt{x}$ as a power of x?	$x^{\frac{1}{2}}$ (x to the power a half)
How do you write $\sqrt[n]{x^m}$ as a power of x? (the nth root of x to the power m)	$x^{\frac{m}{n}}$
What is x^0?	1
How do you write x^{-n} with a positive power?	$\dfrac{1}{x^n}$

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Quadratic Functions	
How do you sketch a quadratic curve (parabola)?	1. Find the shape – "happy" or "sad"? 2. Find the roots (if they exist) – ie. where the curve cuts the x-axis (solve $y=0$) 3. Find where the curve cuts the y-axis ($x=0$) 4. Use symmetry to find the turning point (or use differentiation)
Completing the square: Why do we complete the square? What is the process for completing the square? What form must the expression be in before you can complete the square?	To allow us to make a quick sketch of the parabola, which allows us to find the turning point Identify the x-coefficient Halve it Square it Add it on/take it away OR: expand brackest and equate coefficients Must be $x^2+...$ and not $2x^2$ etc, so take out a common factor if you have to
The discriminant: **What is the condition for...** **... equal roots?** **... two distinct real** roots? **... real roots?** **... non-**real roots? (or no real roots)	 $b^2-4ac=0$ $b^2-4ac>0$ $b^2-4ac\geq0$ $b^2-4ac<0$
How do you show that a line is a tangent to a curve?	Substitute the line into the curve and solve the equation to show that there are equal roots (or show that $b^2-4ac=0$)
What does it mean to say that a quadratic is irreducible?	It cannot be factorised

Polynomials	
How do you show that $x-a$ is a factor of $f(x)$?	Use synthetic division (with a) to show that the remainder is zero, or show that $f(a)=0$
How do you factorise a cubic?	First find a linear factor, using synthetic division, then factorise the quadratic from the bottom row of the table.
How do you sketch the graph of a polynomial?	1. Find where the curve crosses the x-axis ($y=0$) and the y-axis ($x=0$) 2. Differentiate and solve $\dfrac{dy}{dx}=0$ to find the stationary points 3. Use a nature table to determine nature 4. Sketch the graph

Integration	
How do you integrate?	Increase the power by one, then divide by the new power
How do you prepare for integration?	Change any roots into powers x must not be on the denominator (bottom) of any fraction Any pairs of brackets should be expanded
When integrating an indefinite integral (one with no limits), what must we always remember?	+C
Why do we integrate?	To find the area under a curve, or to recover $f(x)$ from $f'(x)$
What do we have to remember when the enclosed area is below the x-axis?	The answer will be negative, so we explain this fact and change the answer to positive
What do we have to remember when the area is partly above and partly below the x-axis?	We have to work out the areas separately (one above x-axis, one below) then add
How do we find the area between two curves or a line and a curve? How do we find where the curves meet?	$\int (\textit{curve above} - \textit{curve below})\, dx$ Use $y = y$ and solve
What do we get if we integrate acceleration? What do we get if we integrate speed?	Speed Distance

Compound Angle Formulae	
$\cos(A + B) = ?$ $\cos(A - B) = ?$ $\sin(A + B) = ?$ $\sin(A - B) = ?$	$\cos A \cos B - \sin A \sin B$ $\cos A \cos B + \sin A \sin B$ $\sin A \cos B + \cos A \sin B$ $\sin A \cos B - \cos A \sin B$
When asked to find the exact value of sin, cos or tan, what should you look for? If a right-angled triangle is not involved, what should you do?	Right-angled triangles Try to make an expression up which involves right-angled triangles and exact values you know (eg 30, 45, 60 degrees)

If you are give sin, cos or tan and told that the angle is acute ($0° < x° < 90°$, $0 < x < \frac{\pi}{2}$), how can you find the other ratios as exact values?	Draw a right-angled triangle, use Pythagoras to find the missing side, then use SOHCAHTOA
sin2A = ? cos2A = ? (three possible answers)	$2\sin A\cos A$ $\cos^2 A - \sin^2 A$ $2\cos^2 A - 1$ $1 - 2\sin^2 A$
How can you expand cos4A, sin4A etc? How can you expand cos3A etc?	Write as (2A+2A) then expand using the formulae Write as (2A+A) then expand using the formulae
When solving a trig equation, what two-step process shoud you follow?	Is it a "straight-forward solve"? If not, then "double angle solve"
How do you recognise and solve a **"straight-forward solve"**?	sin, cos or tan appears once only Solve to find acute angle, then use ASTC
How do you recognise and solve a **"double-angle solve"**?	Look for a double angle and a single angle (eg 2A and A) Replace the double-angle formula with an appropriate single expression, then make one side zero and factorise in order to solve
What should you always check at the end of a trig question?	Should the answer be given in degrees or radians?

The Circle	
What kind of **circle has equation...** $x^2 + y^2 = r^2$? $(x-a)^2 + (y-b)^2 = r^2$? $x^2 + y^2 + 2gx + 2fy + c = 0$?	centre $(0, 0)$, radius r centre (a, b), radius r centre $(-g, -f)$, radius $\sqrt{g^2 + f^2 - c}$
How do you find the equation of a circle? Do you need to expand the brackets and tidy up your answer?	Find the centre and radius, then use $(x-a)^2 + (y-b)^2 = r^2$ No!!
How can you show that an equation does NOT represent a circle?	Try to find the radius – you should be left with the square root of a negative number, which is impossible, or zero
How do you find where a line meets a circle?	Rearrange the line into the form $y=$ or $x=$ (whichever is easier) then substitute this into the circle and solve
How do you show that a line is a tangent to a circle?	As above – you should find equal roots, ie only one point of contact (alternatively, show that $b^2 - 4ac = 0$)
How do you show that a line does not meet a circle at all	As above – this time show that there are no real roots, ie $b^2 - 4ac < 0$
How do you find the equation of a tangent to a circle?	Find the gradient of the radius Use $m_1 \times m_2 = -1$ to find the gradient of the tangent Then use $y - b = m(x - a)$
What is a common tangent?	A line which is a tangent to two circles
How do I show that two circles touch externally?	Show that the distance between the two centres is equal to the sum of the two radii
What is meant by congruent circles? What is meant by concentric circles?	Circles that are the same size Circles with the same centre

Vectors	
What is the difference between a vector and a scalar?	A vector has magnitude (size) and direction, whereas a scalar only has magnitude
What is meant by giving a vector in component form?	Writing the answer as a column vector with brackets, eg $\begin{pmatrix} a \\ b \\ c \end{pmatrix}$
How would you write this in i, j, k form?	$a\underline{i} + b\underline{j} + c\underline{k}$
How do you find the magnitude (length) of vector $\underline{u} = \begin{pmatrix} a \\ b \\ c \end{pmatrix}$?	$\|\underline{u}\| = \sqrt{a^2 + b^2 + c^2}$
How do you find vector $\overrightarrow{AB}$?	$\overrightarrow{AB} = \underline{b} - \underline{a}$
How do you show that two vectors are parallel?	Show that one vector is a multiple of the other
If point P divides AB in the ratio m:n, how do you find the coordinates of P?	Use the Section Formula: $\underline{p} = \dfrac{1}{m+n}(n\underline{a} + m\underline{b})$ and then write out the coordinates of P (or use ratios to create an equation and solve)
What are the two forms of the scalar (or dot) product?	$\underline{a} \cdot \underline{b} = \|\underline{a}\|\|\underline{b}\| \cos \theta$ (for this version, remember that the vectors must NOT be "nose-to-tail") $\underline{a} \cdot \underline{b} = a_1 b_1 + a_2 b_2 + a_3 b_3$
How do you find the angle between two vectors?	Use the dot product and solve to find θ - or use formula $\cos \theta = \dfrac{\underline{a} \cdot \underline{b}}{\|\underline{a}\|\|\underline{b}\|}$
How do you show that two vectors are perpendicular?	Show that $\underline{a} \cdot \underline{b} = 0$
Useful rules: $\underline{a} \cdot \underline{a} = ?$ $\underline{a} \cdot (\underline{b} + \underline{c}) = ?$	$\|\underline{a}\|^2$ $\underline{a} \cdot \underline{b} + \underline{a} \cdot \underline{c}$

Further Calculus	
What do you get if you differentiate: $\sin x$? $\cos x$?	$\cos x$ $-\sin x$
What do you get if you integrate: $\sin x$? $\cos x$?	$-\cos x + c$ $\sin x + c$
What is the chain rule for differentiation? (How do you differentiate $f(g(x))$?)	$f'(g(x)) \times g'(x)$ (differentiate around the brackets, then multiply by the derivative of what is inside the brackets)
What do you get if you differentiate: $\sin(ax+b)$? $\cos(ax+b)$?	$a\cos(ax+b)$ $-a\sin(ax+b)$
What do you get if you integrate: $\sin(ax+b)$? $\cos(ax+b)$?	$-\dfrac{1}{a}\cos(ax+b) + c$ $\dfrac{1}{a}\sin(ax+b) + c$
What you get if you integrate $(ax+b)^n$?	$\dfrac{(ax+b)^{n+1}}{a(n+1)} + c$

The Wave Function	
How do you express $a\cos x + b\sin x$ in the form $k\cos(x \pm \alpha)$ or $k\sin(x \pm \alpha)$?	Expand the brackets Equate coefficients Solve to find k (square and add to get k^2) Solve to find α (divide to get $\tan\alpha$)
How do you know which quadrant α is in?	Look at the signs for $k\cos\alpha$ and $k\sin\alpha$ - if both are positive then α is acute, otherwise you need to do an ASTC diagram
Given the choice, which version of the wave function should you use?	If it starts with cos, use $k\cos(x \pm \alpha)$ If it starts with sin, use $k\sin(x \pm \alpha)$ Use the version which keeps both coefficients positive, if possible
How do you find the maximum or minimum values of a wave function	Think of the graph: when is cos (or sin) at a maximum or minimum, then adjust as necessary
How do you solve $a\cos x + b\sin x = c$?	Put the left-hand side into a wave function form, then solve in the usual way
What if the question has $2x$ or $3x$ etc?	You still solve the problems in the usual way with k and α found as before – but at the end you will need to divide any answers to find x

Exponential and Logarithmic Functions	
What points does the graph of $y = a^x$ always pass through? (y equals a to the power x)	$(0,1)$ and $(1, a)$
What points does the graph of $y = \log_a x$ always pass through? (y equals the log of x, base a)	$(1,0)$ and $(a,1)$
How do you rewrite $y = \log_a x$ in power form?	$x = a^y$
How do you solve an equation where x is the power? (eg $4^x = 10$)	Take logs of both sides then use log rules to work out x
How do you solve a log equation?	Express each side as a single log then "cancel" the logs Or, get logs to one side and numbers to the other, then rewrite using power form
Log rules: $\log x + \log y = ?$ $\log x - \log y = ?$ $\log x^n = ?$ $\log_a 1 = ?$ $\log_a a = ?$	$\log xy$ $\log \dfrac{x}{y}$ $n \log x$ 0 1
How do you get log to base e (the natural log) on your calculator?	ln button
How do you get log to base 10 on your calculator?	log button
If the graph of $\log y$ against $\log x$ is a straight line, how do you find y in terms of x?	$y = kx^n$ The values of k and n can be found from the graph
If the graph of $\log y$ against x is a straight line, how do you find y in terms of x?	$y = ab^x$ The values of a and b can be found from the graph

A Parent's Guide to Supporting Your Child in Maths

Braes High School 2025

Understanding the Course

National 5, Higher and AH Mathematics: These are the traditional maths courses. They focus on building foundational algebraic, geometric, and trigonometric skills. This is the path for students interested in STEM subjects.

National 5 & Higher Applications of Mathematics: These newer courses are all about applying maths to real-world problems. It covers topics like financial maths, statistics, and project planning. This is an excellent option for students who enjoy using maths in practical contexts.

Exams and Assessment

National 5, Higher and AH Mathematics: Both courses have two papers:

- **Paper 1:** Non-calculator. This paper tests core skills and mental maths. Encourage your child to practise without a calculator.
- **Paper 2:** Calculator. This paper involves more complex problems and requires careful use of a scientific calculator.

National 5 Applications of Mathematics: Similar to the others, this course has a non-calculator and a calculator paper.

Higher Applications of Mathematics: The assessment is split into two parts: a **project** (30 marks) and a **question paper** (65 marks). The project is an opportunity for your child to demonstrate their statistical skills in a practical, real-world context. The project is completed in class time just before the February break.

How We Assess Your Child's Progress

We believe in a multifaceted approach to assessment to ensure every student is on the right track. This isn't just about exams; it's about building consistent skills.

Low-Stakes Assessments

- **Every Two Weeks:** Your child will be assessed on the material covered in the previous two weeks. This is a low-stakes approach designed to build confidence and help us identify any gaps in their understanding early.
- **Purpose:** These regular assessments allow us to pinpoint areas where a student may be struggling and provide targeted support. It also helps students get comfortable with the rhythm of being tested, making the larger exams feel less daunting.

Prelims

Prelim 1:

- **National 5 Maths & Higher Applications:** December
- **National 5 Applications & Higher Maths:** January

Prelim 2:

- **All subjects:** March

Higher Applications Project

https://www[thematics.pdf

Analysis and interpretation (6 marks)

Conclusion (4 marks)

Description of marks	Marks available
Provide a summary that justifies the research question, using the graphical displays and the statistics in context: • make a connection between the graphical displays and the conclusion • make a connection between the descriptive statistics and the conclusion • make a connection between the additional statistics and the conclusion	3
State the final conclusion to the research question, where all graphical displays and statistics are referred to in context and their validity is justified clearly.	1

Homework: A Vital Part of the Learning Process

Homework is not just busywork; it's an essential tool for **building and reinforcing skills** in mathematics.

Our Approach to Homework

Weekly Practice: Homework is issued every week to pupils at all levels. This regular practice is crucial for cementing new concepts and keeping prior knowledge fresh.

Dedicated Time: We allocate class time for students to begin or complete their homework. This gives them an opportunity to ask for help from their teacher before they go home.

Always Fully Attempt: We expect all pupils to submit their homework fully attempted. Even if they get stuck, we ask them to show their working and explain what they found difficult. This helps us to understand their thought process and target our support.

Our Approach to Homework

Their Own Work: Homework should always be the student's own work. While it's great for them to get support from parents, siblings, or online resources, the final submission must reflect their own understanding.

Prompt Feedback: We are committed to providing feedback on homework promptly. This feedback is meant to be acted upon, helping students to learn from their mistakes and improve for the future. Please encourage your learner to look at the feedback given. Full solutions to work will be posted on the class teams page and they should use this to review errors.

How You Can Help at Home

Encourage a Growth Mindset: The single most important thing you can do is to encourage your child. Remind them that mistakes are part of the learning process. The ability to learn is not fixed; it can be improved with effort and practice.

Make Maths a Routine: Consistency is key. Encourage them to do a little bit of maths every night. This could be homework, revising notes, or trying a few past paper questions. Even 20 minutes of focused work is better than a two-hour cramming session once a week.

Provide a Quiet Space: Help them create a dedicated space free from distractions like phones and social media.

Emphasise Asking for Help: Teach them that asking for help is a sign of strength, not weakness. Remind them that our teachers are here to help during class, after-school study, and lunchtime.

How You Can Help at Home

Use Available Resources: Remind them of the excellent resources they have access to, such as supported study, and online resources.

Talk About Maths: Ask them what they are learning. Get them to try and explain a concept to you. If they can teach it, they've mastered it.

Celebrate the little wins!

Completing a tough homework question, understanding a new concept, or getting a good mark on a low-stakes assessment are all reasons to celebrate.

We will acknowledge and celebrate that with them.

This positive reinforcement can be a powerful motivator.

Be a Cheerleader, Not a Coach

Remember, your role is to be your child's biggest fan.

While it's tempting to jump in and solve a problem for them, try to resist. Instead, ask them questions like, "What have you tried so far?" or "What does the first step in your notes say?" This encourages them to develop their own problem-solving skills, which is what will truly help them in the exam.

Key Resources for Students

Braes Maths Blog: Our department blog has notes, links to videos, and practice questions.

SQA Past Papers: The best way to prepare for an exam is to practise with past papers. They can be found on the SQA website and are a crucial part of the revision process. Topic specific questions can be found on dynamic maths.

Homework Haven: We offer a dedicated supported study TEAM where young people can get help with their homework from staff and fellow pupils. Joining Code for pupils: zzinhef

Small Group Supports: Our team of teachers offers additional help sessions throughout the year to focus on tricky topics. These may be topics based or exam technique. Pupils will be made aware of these throughout the year.

Larger events: Braes Maths and English study weekend, Easter School and more to follow...

Online Platforms: Encourage your child to use platforms like **Achieve** or **Dynamic Maths** which provide excellent practice questions and video tutorials.

The Braes RAP: Achieving in Mathematics

Rigour

- **It's not about being a genius; it's about being accurate.**
- **What it means:** Paying close attention to detail, showing all working, and checking answers carefully. It means knowing that a small sign error can change the entire outcome of a problem.
- **How to apply it:** Encourage your child to double-check their work. Have them try to solve a problem a second time, maybe in a different way, to make sure their answer is consistent.

The Braes RAP: Achieving in Mathematics

Aspiration

- **It's about aiming high.**
- **What it means:** Having a belief that they can achieve the best possible result. It means not settling for a pass when they are capable of a Grade A or B.
- **How to apply it:** Talk to them about their goals and help them set small, achievable targets. Remind them that every time they overcome a difficult problem, they are one step closer to their goal.

The Braes RAP: Achieving in Mathematics

Perseverance

- **It's about not giving up when the going gets tough.**
- **What it means:** Knowing that success in maths comes from practice, not from a single moment of inspiration. It's about being resilient when a problem feels too hard and trying a different approach.
- **How to apply it:** When they're frustrated, tell them a story about a time you struggled with something and eventually succeeded. Remind them that every expert was once a beginner. The path to success in maths is never a straight line.

Thank You

Thank you again for joining us this evening.

Your support is invaluable.

Please don't hesitate to get in touch with your child's teacher if you have any questions or concerns.

Working together, we can ensure every student has the best possible chance to succeed.

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This guide explains how **Mathematics** and **Applications of Mathematics** align with different career paths. The information is subject to change and is not a comprehensive list, so **always** check specific course or career requirements.

Mathematics focuses on algebra, calculus, and problem-solving.

Applications of Mathematics covers numeracy, finance, and data handling for everyday use.

Launched in 2021, just over 35,000 pupils worked towards a National 4, National 5 or Higher Applications of Mathematics qualifications in 2024 (SQA Statistics). It is recognised as a suitable alternative to Mathematics when applying to <u>most</u> work and study opportunities.

✅ **Applications of Mathematics IS likely a suitable alternative to Mathematics, when applying to:**

Acting	Agriculture
Art	Childcare
Criminology	Dance
Dental Nursing/Oral Health*	English
Fire Service	Film and Media
Geography*	Graphic Design
Hair and Beauty	History
Hospitality	Journalism
Languages	Law
Midwifery*	Music
Nursing*	Paramedic Science*
Philosophy	Physiotherapy*
Police*	Politics
Social Work	Teaching*
Theatre	Tourism
Veterinary*	

*Further detail – when it **IS** likely to be suitable

ℹ Applications of Mathematics MAY be a suitable alternative to Mathematics

Accounting and Finance*	Architecture*
Armed Forces/Military*	Business*
Computing*	Dentistry*
Economics*	Electrical (Electrician) *
Joinery*	Medicine*
Plumbing*	Psychology*
Science*	Sports*

*Further detail – when it MAY be suitable

✖ Applications of Mathematics is NOT recommended as an alternative to Mathematics

Mathematics*	Engineering*

*Further detail – when it is NOT recommended

*Further Detail

**✔ When Applications of Mathematics IS likely to be a suitable alternative to Mathematics
But still check**

Dental Nurse/Oral Health
The following courses offer training in Dental Nursing/Oral Health and have no Mathematics requirements:
- **Glasgow Caledonian University BSc Oral Health Science**
- **New College Lanarkshire HNC Dental Nursing**
- **University of the Highlands and Islands BSc Oral Health Sciences**

Geography
For example, both the **MA Geography** and **BSc Geography** at the University of Edinburgh accept Mathematics or Applications of Mathematics.

Midwifery
There are three universities in Scotland that offer degrees in midwifery. They all require Mathematics or Applications of Mathematics at National 5 Grade C
- **Edinburgh Napier University**
- **Robert Gordon University**
- **University of West of Scotland**

Nursing
Some nursing degrees require National 5 Mathematics or Applications of Mathematics, such as **Glasgow Caledonian University**

Paramedic Science
Some Paramedic Science degrees require National 5 Mathematics or Applications of Mathematics, such as **Glasgow Caledonian University** and **Queen Margaret University**.

Physiotherapy
There are three universities in Scotland offering degrees in physiotherapy.
- **Glasgow Caledonian University** – No Mathematics requirement
- **Queen Margaret University** - Requires National 5 Mathematics or Applications Mathematics. Two of Biology, Physics, Chemistry or Mathematics/Applications of Mathematics at Higher**
- **Robert Gordon University** - two from Biology/Human Biology, Chemistry, Mathematics/Applications of Mathematics and Physics**

Police
You **do not need** any formal qualifications to become a police officer with Police Scotland.
The application process involves the **Police Scotland Entrance Test (PSET)**, which includes a numeracy element. Applications of Mathematics is a suitable subject to prepare for this.

Teaching
National 5 Mathematics or Application of Mathematics at C is required.
For an example, see the **University of Edinburgh**

Veterinary
Applications of Mathematics is a suitable alternative to Mathematics for the following courses:
- **Scotland's Rural College (SRUC) BVSci Veterinary Science**
- **University of Edinburgh BVM&S Veterinary Medicine and Surgery**
- **University of Glasgow Veterinary Medicine & Surgery BVMS****
- **University of Glasgow Veterinary Biosciences BSc/MSci****

> ℹ️ **When Applications of Mathematics MAY be a suitable alternative to Mathematics Double check**

Accounting and Finance
Examples where Applications of Mathematics is a suitable alternative:
- **Dundee University BAcc (Hons) Accountancy**
- **Queen Margaret University BA (Hons) Business Management with Finance**
- **University of the Highlands and Islands BA (Hons) Accounting and Finance**
- **University of Strathclyde BA Hons Accounting – 'Mathematics or Applications of Mathematics is required for Accounting'**

Examples where Applications of Mathematics is not a suitable alternative:
- **University of Edinburgh MA Accounting and Finance** – National 5 Mathematics is required. National 5 Applications of Mathematics is not accepted as an alternative, but Higher Applications of Mathematics is accepted as an alternative**

Architecture
Examples where Applications of Mathematics is a suitable alternative:
- **Dundee University Architecture MArch (Hons)**
- **Edinburgh Napier University BSc (Hons) Architectural Technology**
- **Glasgow School of Art BArch Architecture****
- **Robert Gordon University BSc/MArch Architecture****

Examples where Applications of Mathematics is not a suitable alternative:
- [University of Edinburgh BA/MA Architecture](#)**
- [University of Strathclyde BSc (Hons) Architectural Studies – more information](#)

Armed Forces/Military

The requirements will vary by role. For example, there are no formal qualifications needed to join the [British Army as an infantry soldier,](#) but for engineering roles across all branches of the Armed Forces, Applications of Mathematics is not recommended as an alternative to Mathematics.

Business

Examples where Applications of Mathematics is a suitable alternative:
- [Edinburgh College HNC Business](#)
- [Queen Margaret University BA (Hons) Business Management](#)
- [Strathclyde University BA (Hons) Business](#)
- [University of the Highlands and Islands HND Business](#)

Examples where Applications of Mathematics is not a suitable alternative:
- [Edinburgh University MA Business Management](#) – National 5 Mathematics is required. National 5 Applications of Mathematics is not accepted as an alternative, but Higher Applications of Mathematics is accepted as an alternative**

Computing

Examples where Applications of Mathematics is a suitable alternative:
- [Edinburgh Napier University Beng (Hons) Computing](#)
- [Glasgow Caledonian University BSc (Hons) Computing](#)

Examples where Applications of Mathematics is not a suitable alternative:
- Edinburgh College [HNC Computing](#) and [HND Computer Games Development/Software Development/Computer Networking/Cyber Security](#)**
- [Edinburgh University BEng Computer Science](#)

Dentistry

Dentistry is highly competitive, and anyone wishing to pursue it should thoroughly research requirements. Examples where Applications of Mathematics is a suitable alternative:
- [University of Glasgow Dentistry BDS](#) – Higher Mathematics/Applications of Mathematics or Physics is required**

Examples where Applications of Mathematics is not a suitable alternative:
- [University of Dundee Dentistry BDS](#) – National 5 Mathematics is required, and Applications of Mathematics is **not** accepted as an alternative**

Economics

Examples where Applications of Mathematics is a suitable alternative:
- [University of Dundee BSc (Hons) Economics](#)
- [University of Stirling BSc (Hons) Economics](#)

Examples where Applications of Mathematics is not a suitable alternative:
- [Edinburgh University MA (Hons) Economics](#)

Electrical (Electrician)

Examples where Applications of Mathematics is a suitable alternative:
- [Forth Valley College - Pre-Apprenticeship Electrical Installation](#)

Examples where Applications of Mathematics is not a suitable alternative:
- [West College Scotland - Pre-Apprenticeship Electrical Installation](#)
- [Glasgow Clyde College - Pre-Apprenticeship Electrical Installation](#)

Joinery

Examples where Applications of Mathematics is a suitable alternative:

- **Perth UHI – Construction (Carpentry and Joinery) NPA**
- **Forth Valley College NQ Carpentry & Joinery (Pre-Apprenticeship)****

Examples where Applications of Mathematics is not a suitable alternative:

- **Fife College - National Progression Awards Carpentry & Joinery** - National 4 Mathematics is required. National 4 Applications of Mathematics is not accepted as an alternative, but National 5 Applications of Mathematics is accepted as an alternative**

Medicine

Entry to Medicine is extremely competitive and anyone wishing to pursue medicine should research how choosing Mathematics or Applications of Mathematics impacts their options. Examples where Applications of Mathematics is a suitable alternative:

- **University of Edinburgh**

Examples where Applications of Mathematics is not a suitable alternative:

- **University of Aberdeen****
- **University of Dundee****
- **University of Glasgow****
- **University of St Andrews**

Plumbing

Examples where Applications of Mathematics is a suitable alternative:

- **Perth UHI – Pre-Apprenticeship Plumbing**
- **West College Scotland – Pre-Apprenticeship Plumbing with Renewable Technologies**
- **Forth Valley College – Pre-Apprenticeship in Plumbing****

Examples where Applications of Mathematics is not a suitable alternative:

- **Fife College - National Progression Award: Building Services: Plumbing and Electrical** – National 4 Mathematics is required. National 4 Applications of Mathematics is not accepted as an alternative, but National 5 Applications of Mathematics is accepted as an alternative**

Psychology

Examples where Applications of Mathematics is a suitable alternative:

- **Abertay University BSc (Hons) Psychology**
- **Dundee University BSc (Hons) Psychology**
- **Edinburgh Napier University BA (Hons)/ BSc (Hons) Psychology**
- **Strathclyde University BA (Hons) Psychology**
- **St Andrews University BSc/MA (Hons) Psychology**
- **University of the Highlands and Islands BSc (Hons) Psychology**

Examples where Applications of Mathematics is not a suitable alternative:

- **Edinburgh University BSc (Hons) Psychology**

Science

Examples where Applications of Mathematics is a suitable alternative:

- **University of Edinburgh BSc (Hons) Biological Sciences**
- **University of Highlands and Islands HNC Applied Sciences**
- **BSc (Hons) Food Science, Nutrition and Wellbeing at the University of Abertay**

Examples where Applications of Mathematics is not a suitable alternative:

- **University of Edinburgh BSc (Hons) Physics**
- **University of Edinburgh BSc (Hons) Chemistry**

Sports

Examples where Applications of Mathematics is a suitable alternative:

- **Aberdeen University BSc (Hons) Sports And Exercise Science**
- **Abertay University BSc (Hons) Sports Development and Coaching**
- **Heriot Watt University BSc (Hons) Sport and Exercise Science**
- **Stirling University BA (Hons) Sport Development and Coaching**

Examples where Applications of Mathematics is not a suitable alternative:

- **Edinburgh Napier University BSc (Hons) Sports Coaching** – National 5 Mathematics is required. National 5 Applications of Mathematics is not accepted as an alternative, but Higher Applications of Mathematics is accepted as an alternative
- **University of Edinburgh BSc (Hons) Applied Sport Science**

✖	**When Applications of Mathematics is NOT recommended as a suitable alternative to Mathematics Still check with institutions**

Engineering

Engineering requires algebra, calculus, and trigonometry, which is covered in-depth within Mathematics. Applications of Mathematics is not considered as an alternative.

Mathematics

Mathematics involves algebra, calculus, and trigonometry, which is covered in-depth within Mathematics. Applications of Mathematics is not considered as an alternative.

Why Check?

Entry requirements may change, so individuals are encouraged to check with the relevant colleges or universities. This guide is for general information only and should not be used as a substitute for checking official university requirements.

As part of widening access efforts, some institutions may offer greater flexibility with entry requirements, so it may be worth contacting them directly for guidance if widening access criteria apply.

Skills Development Scotland

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SOURCES: Information from reliable online sources with confirmation and/or further detail sought via college and university admissions.

**Confirmed by admissions in 2025

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To any report issues or make resource suggestions, contact SDS National CIAG Team, email: cmsresource@sds.co.uk