

# Post-16 Maths at Meadowhead



A-level Mathematics and  
Further Mathematics

# Post-16 Maths at Meadowhead

What grade do I need?

A-level Mathematics: Grade 6 or above

A-level Further Mathematics: Grade 7 or above

# Post-16 Maths at Meadowhead

What's in the course?

## Edexcel Mathematics

### **Pure Mathematics**

**(66%)**

methods and techniques which underpin the study of all other areas of mathematics, such as, proof, algebra, trigonometry, calculus, and vectors.

### **Statistics**

**(17%)**

statistical sampling, data presentation and probability leading to the study of statistical distributions

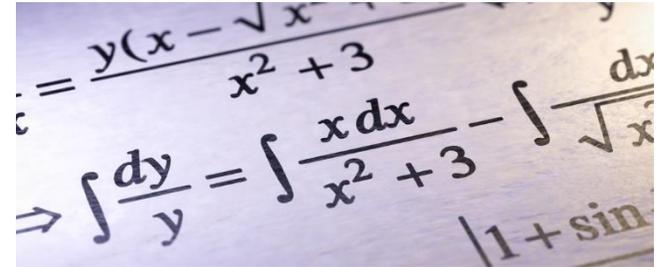
### **Mechanics**

**(17%)**

the study of the physical world, modelling the motion of objects and the forces acting on them.

# What is Pure Mathematics?

Pure mathematics is the study of mathematical concepts independently of any application outside mathematics. These concepts may originate in real-world concerns, and the results obtained may later turn out to be useful for practical applications, but pure mathematicians are not primarily motivated by this.



A wide range of topics are covered in Pure Mathematics in Y12. These include algebra topics such as quadratics and polynomials, coordinate geometry and transformations of graphs. Geometry topics include vectors and trigonometry, and number is represented by surds and indices. Calculus appears for the first time as well, and is a large part of the Y13 course.

# What is Statistics?

Reaching conclusions from data and calculating the chance of an event occurring.



Actuaries study statistical information to calculate the risk of a driver of a certain age having a car accident or the risk of flood. This information would be used by insurers in establishing the cost of the annual premiums.

# What is Mechanics?

The modelling of the world around us, the motion of objects and the forces acting on them. For example:

*What angle should a cricketer aim to hit the ball in order to maximise the distance it will travel?*



Students planning careers in physics or engineering would find mechanics particularly useful.

# Post-16 Maths at Meadowhead

## Our Results

	Mathematics A*-B	Mathematics A*-E	Further Maths A*-C	Further Maths A*-E
2019	85%	100%	66%	100%
2018	81%	100%	100%	100%

# Post-16 Maths at Meadowhead

## Our Progress

In 2019, our A-level Mathematics students achieved a “value added” score of +1.31

This means that, on average, they achieved more than one whole grade above national expectations!

## Advice from previous students...

"It's hard"

"5 hours a week are nowhere near enough, use the after-school sessions to stay on top of things"

"Keep your notes organised"

"It's a lot harder than GCSE and requires a lot more work"

"It's tough but rewarding"

"Keep on top of the work done in lessons"

"Revise, revise, revise"

# Post-16 Maths at Meadowhead

Is A level Mathematics needed for entry to university degree courses?

It is important to have strong maths skills for progression to many degree courses at university.

A level Mathematics is also essential or desirable for a wide range of degree courses including the sciences, economics, computing, social sciences and business.

Any student applying to study a degree in a STEM subject should also consider taking Further Mathematics alongside A level Mathematics.

# Post-16 Maths at Meadowhead

Why Study Maths?

<b>Degree subjects</b>	<b>% of students starting courses with A level Maths (2013)</b>
Computing	50%
Economics	69%
Chemistry	71%
Biology	38%
Psychology	13%
Geography	20%
Business & Management	38%
Sociology	4%

# What is Further Mathematics?

- Mathematics and Further Mathematics are two separate A-levels.
- Further Mathematics is an additional A level qualification taken **in addition to** an A level Mathematics course.
- It is designed to stretch and challenge able mathematicians and prepare them for university courses in maths and other related subjects, particularly physics and engineering.
- At Meadowhead you will study Mathematics and Further Maths in parallel throughout Y12 and Y13, with all exams at the end of Y13.

# Further Maths at Meadowhead

What's in the course?

## Edexcel Further Maths

<b>Further Pure Mathematics</b>	Proof Polynomial Roots Volumes of Revolution Hyperbolic Functions	Matrices Maclaurin Series Vectors in 3D Differential Equations	Complex Numbers Further Calculus Polar Coordinates
<b>Further Statistics</b>	Discrete Probability Distributions Geometric Distributions Hypothesis Testing Chi Squared Tests	Poisson and Binomial Distributions Negative Binomial Distributions Central Limit Theorem Probability Generating Functions	
<b>Decision Mathematics</b>	Algorithms Critical Path Analysis Minimum Connectors	Graph Theory Linear Programming Shortest Paths	

# Post-16 Maths at Meadowhead

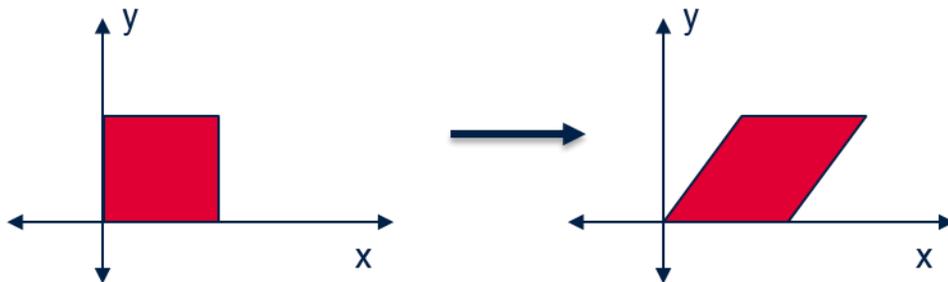
Why Study  
Further Maths?

<b>Degree course</b>	<b>% of students starting course with A level Further Mathematics (2013)</b>
Mathematics	60%
Physics	36%
Engineering	23%
Computer Science	12%
Economics	15%
Finance	21%

# Pure maths in Further Mathematics

Two examples of important Further pure topics are complex numbers and matrices.

Matrices are arrays of numbers such as  $\begin{pmatrix} 1 & 0 \\ 0 & 2 \end{pmatrix}$ . They can be used to solve sets of simultaneous equations and to represent transformations such as the shear shown in the diagram below.



Complex numbers are based on the 'imaginary' number  $\sqrt{-1}$ . They lead to the study of lots of new areas of maths, including fractals like those shown in the image above.

# What is Discrete/Decision Maths?

One area of discrete maths is graph theory, which includes solving problems such as:

*What would be the most efficient route for delivering post around this network of streets?*

This topic uses algorithms vital in computer science.

