A LEVEL MATHS

Mr Spreadborough

MINIMUM REQUIREMENTS

- Enjoy mathematics!
- Achieve a minimum grade 6 or higher at GCSE
  - Preferable grade 7
- Work ethic to complete independent work
  - It is recommended that for every hour in class you spend 1-2 hours outside reviewing notes and completing homework tasks. That is why you do not have a full timetable.
- Resilience

SPECIFICATION

- AQA Specification
- Pure mathematics and 2 applied
- Year 12 will cover fundamental basics and extend knowledge of GCSE curriculum.
- Year 13 will extend all topics learnt in Year 12

Pure mathematics	Algebra
	Polynomials and Binomial theorem
	Trigonometry
	Differentiation & integration
	Exponentials & logarithms
Statistics	Collecting, representing & interpreting data
	Probabiltiy
	Hypothesis testing
Mechanics	Kinematics – how things move
	Forces & Newton's laws
	Vectors – but not the same as GCSE vectors

All of the content in the AS/A level Mathematics qualification is compulsory and is the same for all examination boards.

Pure Mathematics **(66%)**
methods and techniques which underpin the study of all other areas of mathematics, such as, proof, algebra, trigonometry, calculus, and vectors.

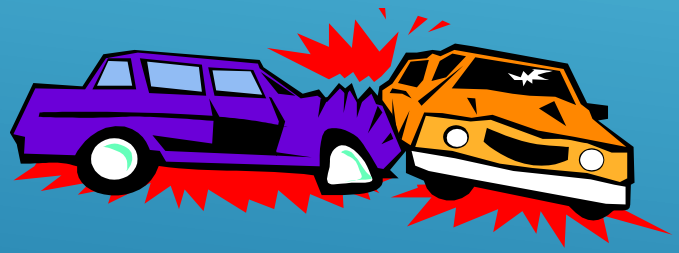
Statistics **(17%)**
statistical sampling, data presentation and probability leading to the study of statistical distributions

Mechanics **(17%)**
the study of the physical world, modelling the motion of objects and the forces acting on them.

WHAT IS STATISTICS?

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.

Students planning careers in medicine or economics would find statistics particularly useful.



WHAT IS MECHANICS?

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

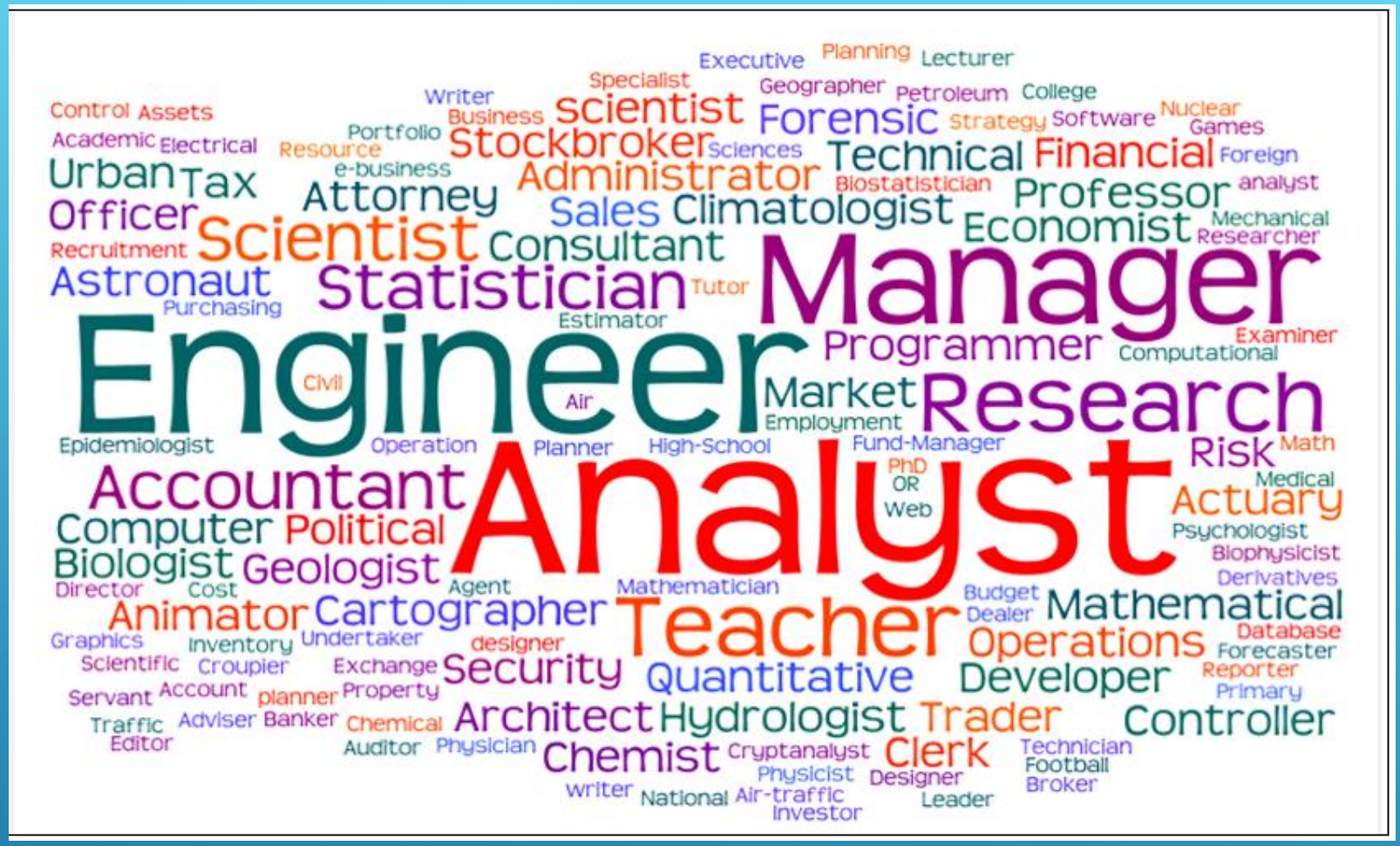
What angle should a cricketer aim to hit the ball in order to maximise the distance it will travel?

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

WHY STUDY A LEVEL MATHEMATICS

Studying Mathematics and Further Mathematics will:

- provide a stimulating and challenging course;
- develop key employability skills such as problem-solving, logical reasoning, communication and resilience;
- increase knowledge and understanding of mathematical techniques and their applications;
- support the study of other A level subjects;
- provide excellent preparation for a wide range of university courses;
- lead to a versatile qualification that is well-respected by employers and higher education.



CAREERS USING MATHEMATICS

TERMINAL ASSESSMENTS

- 3 Exam papers May - June of final year.
  - 1 Pure Paper 33% Final grade
  - 1 Pure and Statistics 33% Final grade
  - 1 Pure and Mechanics 33% Final grade
- Students will sit mock assessments in Year 12 and 13
- 2 Exam papers May-June of first year for AS in Mathematics
  - 1 Pure and Statistics 50% Final grade
  - 1 Pure and Mechanics 50% Final grade

TYPICAL LESSON

- Retrieval practise of previous content
- New concept
  - Direct instruction with modelling
- Embedding concepts
- Homework
  - Practice questions and revision

$y = x^2 + x + 3$

Find $\frac{dy}{dx}$ **A**

Differentiate $3x^2 - x^3 - 1$ with respect to x **B**

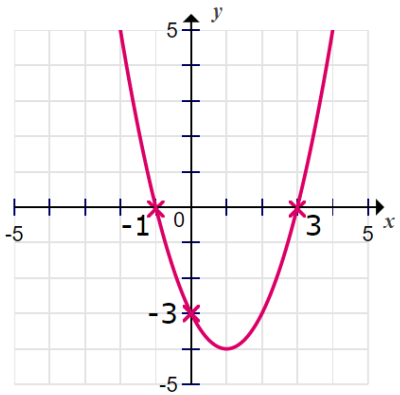
$y = (x^2 + 2)(x - 1)$

Find $\frac{dy}{dx}$ **C**

Sketch the graph of

$$y = x^2 - 2x - 3$$

Hence find the gradient at the points where the graph cuts the x-axis.



To find the gradient at $x = -1$ and $x = 3$:

find $\frac{dy}{dx}$:

$y = x^2 - 2x - 3$ $\quad \frac{dy}{dx} = 2x - 2$

at $x = -1$ $\quad \frac{dy}{dx} = 2 \times -1 - 2 = \mathbf{-4}$