Maths Year 9

Curriculum Intent

Mathematic teachers are striving for all students to be successful and enjoy the subject, irrespective of their prior experience. Students will be encouraged to see the link between topics across the curriculum, as well as their application to problems, which can include a real-life emphasis.

Students are being prepared for studying the subject at GCSE, in the Sixth Form and beyond. They will appreciate its relevance to the world of work, in particular, where problem-solving strategies are needed to tackle tasks where the correct approach is not immediately clear.

As well as being knowledge with their application, students will need to adopt a risk- taking approach in order to make an initial attempt. They will need to be reflective of the solution, or progress made towards one, and ensure their final answer is communicated in a mathematically coherent manner.

Autumn Term FDP Review |Probability |Set and Venn Diagrams Solving Linear Simultaneous Equations Algebraically & Graphically

FDP Review

Convert between fractions, decimals and percentages
Complete all 4 operations with fractions and/or decimals

Set and Venn Diagrams

Draw and interpret information in a Venn diagram
Use the language of sets and formal set notation, including universal set, intersection and union
Calculate probabilities from a Venn diagram

Probability

Use the language of chance
Understand and use the probability scale
Calculate the theoretical probability of a single event
Know and use that the probabilities of complementary events sum to 1
Use a sample space diagram to help find the sample space for a pair of combined events
Find the probability of a pair of combined events by counting outcomes and by multiplying probabilities
Draw and use a probability tree diagram for combined events
Draw and use a frequency tree diagram for combined events
Use probability and frequency tree diagrams to help calculate the probability of combined events
Draw and use a two-way table for combined events
Use a two-way table to help calculate the probability of combined events
Compare and contrast the use of a probability tree diagram, frequency tree diagram and two-way table
Calculate the experimental probability (relative frequency) of a single event
Know that the experimental probability will be more accurate with a greater number of trials
Calculate the number of expected outcomes in a given number of trials
Understand the difference between fair and biased experiments

Solving Linear Simultaneous Equations Algebraically

Solve a single linear equation (revision)
Understand and form pairs of equivalent equations
Understand and solve simple systems of equations
Add/subtract 2 equations to form a new equation
Solve a system of simultaneous equation by eliminating a variable – including with scaling
Show the solutions to a system of simultaneous equations on a Venn diagram
Substitute with expressions
Solve a system of simultaneous equation by substitution – including with rearrangement

Solving Linear Simultaneous Equations Graphically

Graph a linear equation of the form: y = mx + c
Interpret the coordinates on the line as solutions to the equation of the line
Manipulate linear equations e.g. to the form: ax + by = c
Identify the intersection point of two linear graphs as their simultaneous (common) solution
Estimate the solution to a pair of linear simultaneous equations from their graph
Understand that a pair of parallel lines cannot be solved simultaneously as they do not intersect
Use the graphical solution to a pair of linear simultaneous equations to find the area of an enclosed region
Represent linear inequalities graphically*
Solve a system of linear inequalities graphically
Know that in a system of non-linear simultaneous equations there can be 0, 1 or multiple solutions inequalities*
Represent algebraic expressions using a variety of models including arrays and bar models*

*Set 1 and 2 only

What does Excellence look like?

- Calculate theoretical probability by dividing the number of outcomes that satisfy the event by the number of outcomes
- Number of combined outcomes is calculated by multiplying the number of outcomes of each event
- Probabilities of combined events can be calculated by multiplying the probability of the individual events
- Compare expected outcomes to actual outcomes in order to determine whether an experiment is fair or biased
- Use Venn diagrams and set notation to represent sample space information and to help calculate theoretical probability
- Make deductions from two equations within the same system of equations by addition and subtraction
- Understand solutions to simultaneous linear equations as the single point (coordinate) that both lines pass through
- Identify regions that satisfy multiple simultaneous inequalities

How is homework used to enhance learning?

- Homework book
- Eedi
- Review exercise
- Exam Style questions

Spring Term (subject to change) Constructions, congruence and loci | Pythagoras' Theorem Similarity and enlargement | Surds and trigonometry

Angle Review

Constructions, congruence and loci
Ruler and compass constructions
Congruence
Loci

Pythagoras' Theorem
Using Pythagoras to find missing sides in right angle triangles
Using Pythagoras to solve problems with 3D objects

Ratio Review

Similarity and enlargement
Similarity and enlargement
Area and volume of similar

Surds and trigonometry*
Surds
Using trigonometric ratios to find unknown angles and sides
Solving problems using trigonometric ratios

*Set 1 and 2 only

Summer Term (subject to change) Quadratic Expressions | Quadratic Equations Indices and standard form| Growth and decay

Quadratic Expressions
Creating quadratic expressions
Expanding and factorising binomials

Quadratic Equations
Plotting quadratic graphs
Solving quadratic equations
Completing the square and turning points

Indices and standard form
Index notation and rules
Fractional and negative indices
Comparing and ordering numbers in standard form
Calculating in standard form

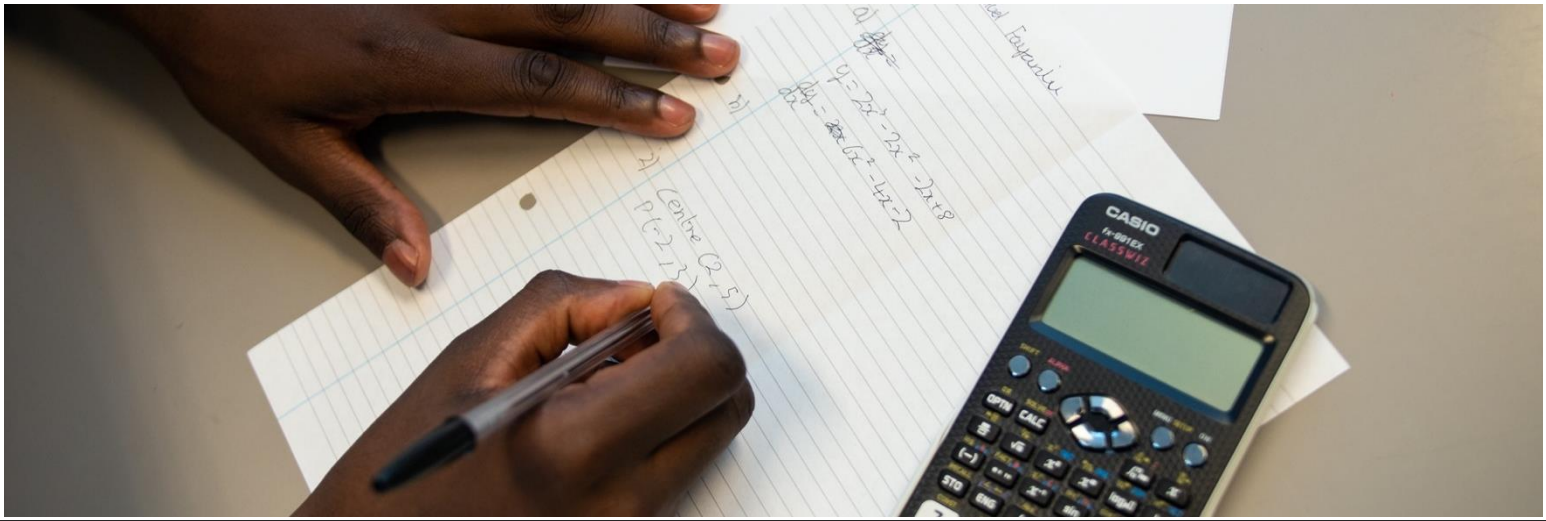
Growth and decay
Compound percentage change
Reverse percentage change
Other growth and decay contexts

How is homework used to enhance learning?

- Homework book
- Eedi
- Review exercise
- Exam Style questions

What does excellence look like?

Area and perimeter of shapes using fractions as lengths of sides.
Use fractions and unknowns with area and perimeter
Rearrange equations to find lengths of sides
Use decimals with equations.
Area and perimeter of shapes.
Use angle rules
Use algebra in problems.



International Opportunities

Within the curriculum

History of fractions https://nrich.maths.org/2515
Tasks for fractions https://nrich.maths.org/public/topic.php?group_id=2&code=19

Al-Khwarizmi Born 830AD Developed Algebra

Muslim mathematician and astronomer whose major works introduced Hindu-Arabic numerals and the concepts of algebra into

European mathematics.

Fibonacci sequence – The magic of Fibonacci numbers Arthur Benjamin – TED talk

Sequence within voting systems

Leonhard Euler 1707 – 1783 A Swiss mathematician who developed notation including the use of π.

Srinivasa Ramanujan 1887-1920 An Indian mathematician who discovered the formula for π

Use temperatures of the states of America in international folder.

The number of Significant figures used for different data changes depending on how accurate you need to be.

John Napier 1550-1617 standardised the use of the decimal point.

Thales c.636 – c.546BC A Greek philosopher found that angles at the base of an isosceles triangle are equal.

Euclid born 300BC A Greek mathematician who was the 'founder of geometry' proved the exterior angles theory and an algorithm for finding HCF and LCM.

Use different units of measurements eg. km, miles as well as different SI units.

Where and why did metric come about?

The golden ratio https://www.livescience.com/37704-phi-goldenratio.html

Use literacy rates as percentages or any other international data.

Use international data.
Baye's theorem https://www.mathsisfun.com/data/bayes-theorem.html
Thomas Bayes 1702 – 1761 English Statistician.
Abraham de Moivre French mathematician 1667 – 1754 developed game theory and actuarial mathematics.