

Maths - Higher Tier

Module 1

Topic Title: Algebra

Brief Summary of Content Studied:

Simplify expressions involving surds. Expand expressions involving surds.
Rationalise the denominator of a fraction.
Use function notation.
Find composite functions.
Find inverse functions.
Find the roots of quadratic functions.
Rearrange and solve simple quadratic equations.
Complete the square for a quadratic expression.
Solve quadratic equations by completing the square.
Solve simple simultaneous equations.
Solve simultaneous equations for real-life situations.
Use simultaneous equations to find the equation of a straight line.
Solve linear simultaneous equations where both equations are multiplied.
Interpret real-life situations involving two unknowns and solve them.
Solve simultaneous equations with one quadratic equation.
Use real-life situations to construct quadratic and linear equations and solve them.

Knowledge Organiser:

https://docs.google.com/presentation/d/1N50_U8Z_WvZKLqNqq5cGENcEqVP4NRsCNLFfXxFVYZ4/edit?usp=sharing

Module 2

Topic Title: Number, Proportion & Measure

Brief Summary of Content Studied:

Find an amount after repeated percentage changes.
Solve growth and decay problems.
Calculate rates.
Convert between metric speed measures.
Use a formula to calculate speed and acceleration.
Solve problems involving compound measures.
Use relationships involving ratio.
Use direct and indirect proportion.
Use the ratio of corresponding sides to work out scale factors.
Find missing lengths on similar shapes.
Use similar triangles to work out lengths in real life.
Use the link between linear scale factor and area scale factor to solve problems.
Use the link between scale factors for length, area and volume to solve problems.
Draw and use scales on maps and scale drawings.
Solve problems involving bearings.
Draw a locus.
Use loci to solve problems.

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<https://docs.google.com/presentation/d/1gr-NZBAUPiJD8MYPyC1ZS-AU1z39wH-IUKkcmbGnID8/edit?usp=sharing>

Module 3

Topic Title: Geometry & Algebra

Brief Summary of Content Studied:

Develop an understanding of the trigonometric ratios
Solve problems using trigonometric ratios in right-angled triangles
Calculate sides and angles using trigonometric ratios
Understand and use upper and lower bounds in calculations involving trigonometry.
Understand how to find the sine of any angle.
Know the graph of the sine function and use it to solve equations.
Understand how to find the cosine of any angle.
Know the graph of the cosine function and use it to solve equations.
Understand how to find the tangent of any angle.
Know the graph of the tangent function and use it to solve equations.
Recognise how changes in a function affect trigonometric graphs
Find the area of a triangle and a segment of a circle.
Use the sine rule to solve 2D problems.
Use the cosine rule to solve 2D problems.
Solve bearings problems using trigonometry.
Use Pythagoras' theorem in 3D.
Use trigonometry in 3D.
Solve inequalities and show the solution on a number line and using set notation.

Module 4

Topic Title: Number & Algebra

Brief Summary of Content Studied:

Represent inequalities on graphs.
Interpret graphs of inequalities.
Recognise and draw quadratic functions.
Find the roots of cubic equations.
Sketch graphs of cubic functions.
Solve cubic equations using graphs.
Draw graphs of reciprocal functions.
Recognise a graph from its shape.
Draw the graph of a circle.
Solve quadratic equations using an iterative process.
Solve cubic equations using an iterative process.

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Module 5

Topic Title: Probability & Statistics

Brief Summary of Content Studied:

Use the product rule for finding the number of outcomes for two or more events.
List all the possible outcomes of two events in a sample space diagram.
Identify mutually exclusive outcomes and events.
Find the probabilities of mutually exclusive outcomes and events.
Find the probability of an event not happening.
Calculate probabilities of repeated events.
Draw and use probability tree diagrams.
Decide if two events are independent.
Draw and use tree diagrams to calculate conditional probability.
Draw and use tree diagrams without replacement.
Use two-way tables to calculate conditional probability.
Use set notation.

Module 6

Topic Title: Proportion & Graphs

Brief Summary of Content Studied:

Write and use equations to solve problems involving direct proportion.
Write and use equations to solve problems involving direct proportion.
Solve problems involving square and cubic proportionality.
Write and use equations to solve problems involving inverse proportion.
Use and recognise graphs showing inverse proportion.
Recognise graphs of exponential functions.
Sketch graphs of exponential functions.
Calculate the gradient of a tangent at a point.
Estimate the area under a non-linear graph.
Understand the relationship between translating a graph and the change in its function notation.
Understand the effect stretching a curve parallel to one of the axes has on its function form.
Understand the effect reflecting a curve in one of the axes has on its function form.