

GCSE Maths Y10 and Y11 Plan - Higher Tier

Unit Number	Unit Name	Topics Covered
1a	Indices and Surds	Negative and fractional indices. Simplify surds to the form $a\sqrt{b}$. Expand brackets containing surds. Rationalise the denominator of a surd such as $2/\sqrt{5}$. Rationalise a denominator in the form $a\sqrt{b}$, $a + \sqrt{b}$ and $a + b\sqrt{c}$. Construct an algebraic proof of number properties.
2a	FDP	Convert recurring decimals to fractions and fractions to recurring decimals.
3a	Algebraic Fractions	Multiply and divide algebraic fractions including quadratics. Add and subtract algebraic fractions including quadratics. Simplify algebraic fractions including quadratics. Expand the product of more than two binomials.
4a	Ratio	Simplify two pairs of ratios when given a common term. Compare lengths using ratio notation and ratio tables. Compare areas and volumes using ratio notation and ratio tables. Solve complex problems involving ratio and algebra. Solve two-way ratio problems.
5a	Pythagoras and Trigonometry	Exact Trigonometric values. Use Pythagoras' Theorem and Trigonometry in 3D. Use the formula for the area of non-right-angled triangles. Use the sine rule to calculate missing sides and angles in non-right-angled triangles. Use the cosine rule to calculate missing sides and angles in non-right angled triangles. Sketch the graphs of $y=\sin(x)$, $\cos(x)$ and $\tan(x)$. Use the trigonometry graphs to solve equations involving $\sin(x)$, $\cos(x)$ and $\tan(x)$.
6a	Advanced Algebraic Equations	Rearrange formulae where the subject appears twice. Use an iterative formula to find an approximate solution to an equation. Show how to rearrange an equation to produce a specified iterative formula. Solve quadratics using the quadratic formula. Solve quadratics using completing the square. Solve fractional linear equations with an unknown in the denominator. Solve a pair of simultaneous equations where one is non-linear.
7a	Volume	Calculate the volume and surface area of a frustum.
8a	Measures	Interpret linear velocity time graphs. Calculate acceleration from a linear velocity time graph. Calculate average acceleration from a non-linear velocity time graph. Calculate instantaneous acceleration from a curved velocity time graph. Calculate the distance travelled by calculating the area under a velocity time graph.

9a	Inequalities	Solve linear inequalities with an unknown on both sides. Represent linear inequalities graphically. Solve a set of linear inequalities in two variables and represent the solution as a region of a graph. Solve quadratic inequalities.
10a	Transformations	Enlarge a shape by a positive scale factor (including fractions) Enlarge a shape by a positive scale factor (including fractions) from a centre. Enlarge a shape by a negative scale factor. Identify both the changes and invariance achieved by combinations of rotations, reflections and transformations. Add and subtract vectors and multiply vectors by a scalar, in both diagrammatic and column form. Understand the relationship between parallel vectors. Use vectors to construct geometric arguments.
11a	Advanced Functions	Use completing the square to calculate the turning point of a quadratic graph. Transform graphs using reflections and translations. Recognise and use the equation of a circle centred at the origin. Find the equation of a tangent to a circle at a given point. Interpret the reverse process as the inverse function. Interpret the succession of two functions as a composite function.
12a	Circle Theorems	Prove the circle theorems. Apply and use the circle theorems.