

Mathematics- GCSE 9 -1 Higher Syllabus

	Does the subject set according to ability?	Yes
	Unit	Skills Covered
	Unit 1	I can ... <ul style="list-style-type: none"> • understand and apply place value correctly. • estimate values including square roots to an appropriate degree of accuracy. • convert a number to its prime factors, including the use of index notation and to apply to questions in context. • find the HCF and LCM for at least two numbers and apply to worded questions. • identify and apply the laws of indices. • use negative and fractional indices. • convert between numbers in standard form, numbers in words and ordinary numbers. • use the four operations with numbers written in standard form. • use surds in geometry questions, simplify surds using perfect square factors and rationalise the denominator. • establish the number of combinations in a given context.
	Unit 2	I can ... <ul style="list-style-type: none"> • simplify algebraic expressions using the rules of indices. • expand and simplify single and double brackets. • factorise expressions, including quadratic expressions. • distinguish between expressions, equations, identities and formulae. • solve equations with the unknown on both sides, and/or involving fractions or brackets. • substitute values into formulae and change the subject of a formula. • generate terms of a Fibonacci-like or geometric sequence. • find the formula of the nth term of an arithmetic sequence and use it to solve problems. • find the formula of the nth term of a quadratic sequence.
	Unit 3	I can ... <ul style="list-style-type: none"> • draw and interpret two-way tables. • draw and interpret pie charts. • draw and interpret back-to-back stem and leaf diagrams. • draw and interpret frequency polygons. • draw scatter graphs and lines of best fit; understand correlation, interpolation, extrapolation and outliers. • calculate averages and range from grouped frequency tables and given values. • find missing values to make a given average. • draw and interpret time series graphs; comment on trends.
	Unit 4	I can ... <ul style="list-style-type: none"> • add, subtract, multiply and divide mixed numbers. • simplify ratios and write ratios as unit ratios. • use ratios to solve problems, including currency conversion. • share an amount in a given ratio. • solve problems using direct proportion. • solve problems involving percentage increase and decrease, including profit and loss calculations. • calculate investment growth using percentage increase or decrease.

	Unit 5	<p>I can ...</p> <ul style="list-style-type: none"> • use the sum of the interior or exterior angles of a polygon to find the size of an interior or exterior angle, or the number of sides of a regular polygon. • use angle facts, including the angles properties of triangles and quadrilaterals, to find the size of unknown angles. • use angle facts to write simple proofs. • use Pythagoras' theorem to find the lengths of sides and sizes of angles in right-angled triangles. • use Pythagoras' theorem to decide whether a triangle is right-angled. • use trigonometry to find the lengths of sides and sizes of angles in right-angled triangles. • recall the exact values of the sine, cosine and tangent of some angles.
	Unit 6	<p>I can ...</p> <ul style="list-style-type: none"> • identify the gradient and y-intercept of a line from its equation and find the equation of a line parallel or perpendicular to a given line, passing through a given point. • find the equation of a line from its graph, and draw a linear graph given its equation (without using a table of values). • find the gradient, midpoint and length of a line segment, given the coordinates of its end points. • interpret and draw real-life graphs, including distance-time and velocity-time graphs. • recognise a quadratic, cubic, reciprocal or circle graph from its shape and describe its features. • estimate the solutions to a quadratic or cubic equation using a graph.
	Unit 7	<p>I can ...</p> <ul style="list-style-type: none"> • find the perimeter and area of a trapezium, and find a missing measurement given the area. • find the circumference and area of a circle, and find the radius or diameter given the circumference or area. • find the arc length or perimeter, the area or the angle of sectors of circles. • convert between units of area and between units of volume. • express percentage error intervals and the upper and lower bounds of measurements as inequalities. • find the volume and surface area of prisms (including cylinders), and find a missing measurement given the volume. • find the volume and surface area of spheres, pyramids and cones.
	Unit 8	<p>I can ...</p> <ul style="list-style-type: none"> • follow written instructions to reflect, rotate, translate or enlarge an object. • fully describe the transformation which maps an object onto a given image. • draw plan and elevations of a 3D object from an isometric sketch; draw a 3D sketch from a given plan and elevations. • use map scales to work out real distances and distances on maps. • read and draw bearings; draw accurate scale drawings. • make accurate constructions including triangles and bisectors. • construct loci and identify the regions described by loci.

	Unit 9	<p>I can ...</p> <ul style="list-style-type: none"> • factorise quadratic expressions; solve quadratic equations by factorising. • solve quadratic equations by completing the square. • substitute values into the quadratic formula and use it to solve quadratic equations. • construct and solve quadratic equations for pictorial and word-based questions. • solve simultaneous equations using a variety of methods. • find the equation of a line given the two the coordinates of two points. • find the coordinates of the points of intersection of a quadratic graph and a linear graph. • find integer values to satisfy inequalities. • solve inequalities; show solutions on a number line and using set notation.
	Unit 10	<p>I can ...</p> <ul style="list-style-type: none"> • find the probability of combined dependent and independent events, using a probability tree diagram where appropriate. • use the fact that $P(A \text{ or } B) = P(A) + P(B)$ for mutually exclusive events. • identify dependent and independent events. • use sample space diagrams and two-way tables to find probabilities. • find expected frequency. • understand set notation and use Venn diagrams to find probabilities.
	Unit 11	<p>I can ...</p> <ul style="list-style-type: none"> • calculate repeated percentage change (including compound interest). • calculate with rates of pay and rates of change. • use the formulae for density and pressure. • use the kinematics formulae. • convert between compound units. • recognise direct and indirect proportion and use the relationship to calculate values.
	Unit 12	<p>I can ...</p> <ul style="list-style-type: none"> • identify congruent triangles, giving reasons for my answer. • identify similar triangles, giving reasons for my answer, and find missing lengths in similar shapes. • use the relationship between scale factors to find missing lengths, areas and volumes.
	Unit 13	<p>I can ...</p> <ul style="list-style-type: none"> • work out the area of any triangle; use this rule to work out the area of a segment. • use the sine rule and cosine rule to find missing lengths and angles in any triangle. • Use the sine rule and cosine rule with bearings to work out bearings and distances. • use upper and lower bounds to work out maximum and minimum possible values. • know basic trigonometric graphs; understand the effects of a transformation on the basic trigonometric graphs. • use trigonometric functions with or without their graphs to find angles from a given trigonometric value and vice versa. • use Pythagoras' theorem and trigonometry in 3D to work out diagonal lengths in polyhedra.

Unit 14	I can ...	<ul style="list-style-type: none"> • explain reasons for sampling. • describe a stratified sample and use a random number list to select data items. • draw and interpret statistical diagrams, including cumulative frequency diagrams, histograms, stem-and-leaf diagrams and box plots. • compare distributions.
Unit 15	I can ...	<ul style="list-style-type: none"> • form equations from real-life problems and solve them by plotting graphs. • solve a pair of simultaneous equations (linear / linear and linear / quadratic) graphically and algebraically; find the length of the line between the intersection points. • identify a region from graphs of given inequalities; find inequalities that define a region on a graph. • work out the area of a region bounded by inequalities; find values that satisfy inequalities. • sketch quadratic graphs; find turning points, x- and y-intercepts; estimate roots of an equation from a graph. • sketch cubic graphs, showing x- and y-intercepts; identify roots from a factorised cubic equation. • match quadratic equations to their graphs. • write the equation of a quadratic with a given turning point or roots. • identify an equation with real roots. • use an iterative process to find real roots of cubic equations.
Unit 16	I can ...	<ul style="list-style-type: none"> • draw a circle accurately and label key features using correct mathematical vocabulary. • use properties of radii and tangents to work out unknown angles. • use properties of chords to work out unknown angles and lengths. • use properties of angles subtended by the same arc and cyclic quadrilaterals to work out unknown angles. • use the angle in a semicircle to work out unknown angles. • use the alternate segment theorem to work out unknown angles. • work out the equation of a tangent from the graph of a circle and the coordinates of the point where the tangent meets the circle. • use a combination of circle theorems to support an algebraic proof.
Unit 17	I can ...	<ul style="list-style-type: none"> • simplify expressions involving surds and rationalise denominators. • evaluate functions, find inverse functions and find composite functions. • rearrange more complex formulae. • simplify algebraic fractions and expressions involving algebraic fractions. • solve equations involving algebraic fractions with variables in the denominators. • show that an identity is true. • prove a statement is untrue by identifying a counter-example.
Unit 18	I can ...	<ul style="list-style-type: none"> • write line vectors as column vectors, use column vectors with coordinates and find the magnitude of a vector. • draw combinations of vectors. • calculate with column vectors. • identify parallel vectors. • solve problems and write proofs using vectors.

	Unit 19	I can ... <ul style="list-style-type: none">• write and use formulae for direct and indirect proportion.• recognise and sketch different types of graphs from their equations.• find an exponential equation, given pairs of coordinates.• find acceleration and distance from a velocity–time graph.• understand the effect of transformations on the graphs of functions.
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