

IGCSE Content

1. Numbers and the Number system	
1.1 Integers	<ul style="list-style-type: none"> directed numbers odd, even and prime numbers, factors and multiples prime factors, common factors and common multiples
1.2 Fractions	<ul style="list-style-type: none"> mixed numbers and vulgar fractions add and subtract, multiply and divide fractions convert between fractions, decimals and percentages convert recurring decimals into fractions
1.3 Decimals	<ul style="list-style-type: none"> terminating decimals recurring decimals
1.4 Powers and Roots	<ul style="list-style-type: none"> squares, square roots, cubes and cube roots index notation and index laws the product of powers of prime factors manipulate surds HCF and LCM
1.5 Set Language and Notation	<ul style="list-style-type: none"> definitions and notation Venn diagrams practical situations
1.6 Percentages	<ul style="list-style-type: none"> percentage as a fraction and as a decimal percentage increase and decrease reverse percentages
1.7 Ratio and Proportion	<ul style="list-style-type: none"> ratio reduction to simplest form divide a quantity in a given ratio proportionality word problems about ratio and proportion
1.8 Degree of Accuracy	<ul style="list-style-type: none"> significant figures or decimal places upper and lower bounds approximations to numerical calculations
1.9 Standard Form	<ul style="list-style-type: none"> $a \times 10^n$ where n is an integer and $1 \leq a < 10$ solve problems involving standard form
1.10 Applying Number	<ul style="list-style-type: none"> standard units of mass, length, area, volume and capacity calculations using time calculations using money, including converting between currencies
1.11 Electronic Calculators	<ul style="list-style-type: none"> Use a scientific electronic calculator

2. Equations, Formulae and Identities	
2.1 Use of Symbols	<ul style="list-style-type: none"> index notation and laws
2.2 Algebraic Manipulation	<ul style="list-style-type: none"> substituting collect like terms multiply out a bracket common factors factorise quadratic expressions algebraic fractions
2.3 Expressions and Formulae	<ul style="list-style-type: none"> algebraic expressions and formulae substitute in expressions and formulae manipulating formulae to change the subject
2.4 Linear Equations	<ul style="list-style-type: none"> solve linear equations set up simple linear equations from data given
2.5 Proportion	<ul style="list-style-type: none"> direct or inverse proportion graphical representation of the equations
2.6 Simultaneous Linear Equations	<ul style="list-style-type: none"> exact solution of two simultaneous equations in two unknowns interpret the equations as lines and the common solution as the point of intersection

2.7 Quadratic Equations	<ul style="list-style-type: none"> solve quadratic equations by factorisation solve quadratic equations by using the quadratic formula form and solve quadratic equations from data given in a context solve simultaneous equations one linear, one quadratic in two unknowns
2.8 Inequalities	<ul style="list-style-type: none"> symbols $>$, $<$, \geq and \leq open and closed intervals on a number line linear inequalities and represent the solution set on a number line linear inequalities on Cartesian graphs quadratic inequalities in one unknown and represent on a number line

3. Sequences, Functions and Graphs	
3.1 Sequences	<ul style="list-style-type: none"> generate terms of a sequence linear expressions to describe the nth term of an arithmetic sequence
3.2 Functional notation	<ul style="list-style-type: none"> the concept that a function is a mapping between elements of two sets function notations domain and range which parts of a domain may need to be excluded composite function inverse function
3.3 Graphs	<ul style="list-style-type: none"> interpret information presented in a range of graphs coordinates midpoint straight line conversion graphs gradient of a straight line $y = mx + c$ generate points and plot graphs (cubic/reciprocal) find the gradients of non-linear graphs find the intersection points of two graphs Using graphs to solve equations parallel lines
3.4 Calculus	<ul style="list-style-type: none"> variable rate of change differentiate integer powers of x determine gradients, rates of change, turning points by differentiation and relate these to graphs distinguish between maxima and minima kinematics

4. Geometry	
4.1 Angles and Triangles	<ul style="list-style-type: none"> acute, obtuse, reflex and right angles use angle properties of intersecting lines, parallel lines and angles on a straight line isosceles, equilateral and right-angled triangles and the angle properties of these triangles
4.2 Polygons	<ul style="list-style-type: none"> names of polygons properties of the parallelogram, rectangle, square, rhombus, trapezium and kite regular polygon and calculate interior and exterior angles of regular polygons angle sum of polygons congruence
4.3 Symmetry	<ul style="list-style-type: none"> line and rotational symmetry lines of symmetry and the order of rotational symmetry

4.4 Measures	<ul style="list-style-type: none"> time intervals in terms of the 24-hour and 12-hour clock estimates of a range of measures three figure bearings relationship between average speed, distance and time
4.5 Construction	<ul style="list-style-type: none"> construct triangles and other two-dimensional shapes using a combination of a ruler, protractor and compasses solve problems using scale drawings use straight edge and compasses to <ul style="list-style-type: none"> (i) construct the perpendicular bisector of a line segment (ii) construct the bisector of an angle
4.6 Circle Properties	<ul style="list-style-type: none"> centre, radius, chord, diameter, circumference, tangent, arc, sector and segment of a circle chord and tangent properties of circles internal and external intersecting chord properties circle theorems angle subtended by an arc at the centre of a circle is twice the angle subtended at any point on the remaining part of the circumference angle subtended at the circumference by a diameter is a right angle angles in the same segment are equal the sum of the opposite angles of a cyclic quadrilateral is 180° the alternate segment theorem
4.7 Geometrical Reasoning	<ul style="list-style-type: none"> provide reasons, using standard geometrical statements, to support numerical values for angles obtained in any geometrical context involving lines, polygons and circles
4.8 Trigonometry and Pythagoras' Theorem	<ul style="list-style-type: none"> Pythagoras' theorem in two dimensions sine, cosine and tangent of acute angles to determine lengths and angles of a right-angled triangle sine, cosine and tangent of obtuse angles angles of elevation and depression the sine and cosine rules for any triangle Pythagoras' theorem in 3 dimensions $\frac{1}{2}bc \sin A$ for the area of a triangle solve problems in 3 dimensions including finding the angle between a line and a plane Graphs of $\sin x$, $\cos x$ and $\tan x$
4.9 Mensuration	<ul style="list-style-type: none"> convert measurements within the metric system to include linear, area and volume units perimeter and area of shapes circumferences and areas of circles surface area and volumes of shapes including cuboids and cylinders, sphere and a right circular cone face, edge and vertex in the context of a three-dimensional solids perimeters and areas of sectors of circles convert between volume measures
4.10 Similarity	<ul style="list-style-type: none"> geometrical properties of similar figures areas of similar figures are in the ratio of the square of corresponding sides volumes of similar figures are in the ratio of the cube of corresponding sides areas and volumes of similar figures in solving problems

5. Vectors and Transformation Geometry	
5.1 Vectors	<ul style="list-style-type: none"> magnitude and direction vector notation multiply vectors by scalar quantities add and subtract vectors modulus (magnitude) of a vector find the resultant of two or more vectors vector methods for simple geometrical proofs
5.2 Transformation Geometry	<ul style="list-style-type: none"> rotations, reflections, translations, enlargements construct mirror line, reflected shape, translated shape, enlargements congruence of rotations, reflections and translations enlargements preserve angles and not lengths the scale factor of an enlargement descriptions of transformations use and interpret maps and scale drawings

6. Statistics	
6.1 Graphical Representation of Data	<ul style="list-style-type: none"> methods of presenting data methods of tabulation to enable the construction of statistical diagrams interpret statistical diagrams construct and interpret histograms construct cumulative frequency diagrams from tabulated data
6.2 Statistical Measures	<ul style="list-style-type: none"> mean, median, mode and range for a discrete data set estimate for the mean for grouped data modal class for grouped data estimate the median from a cumulative frequency diagram measure of spread interquartile range from given data or from a cumulative frequency diagram
6.3 Probability	<ul style="list-style-type: none"> probability scale estimates or measures of probability from theoretical models sample space, list of all the outcomes in a systematic way estimate probabilities complement of an event happening addition rule of probability for mutually exclusive events expected frequency tree diagrams independent events conditional probability