



GRADE 9 STANDARDS OF MATHEMATICS REQUIRED

TOPIC	CONTENT
Set Language and Notation	Use set language and notation, and Venn diagrams to describe sets and to represent the relationship between them. Recognize and use the following notations: $A \cup B, A \cap B, n(A), \in, \notin, \emptyset, \subset, \subseteq$ Apply the above notations and combinations of them in the solution of challenging problems.
Estimation and Standard Form	Make estimates of numbers, quantities and lengths. Give approximations to specific number of significant figures and decimal places. Write numbers in standard form; $A \times 10^n$ where n is a positive or negative integer, and $1 \leq A < 10$
Number Patterns and Sequences	Recognise patterns and complete a given sequence. Solve word problems involving sequences.
Fraction, Decimal Fraction and Percentages.	Fractions, order fractions, perform basic operations on fractions, decimal fractions and percentages and be able to convert one to another; express a quantity as a percentage of another; calculate percentage increase or decrease; calculate profit and loss.
Ratio and Proportion	Recognize the notation of ratios and express them in their simplest forms; Express a given quantity in a given ratio, solve word problems involving ratio, use direct and indirect proportions.
Mensuration	Calculate the perimeter and area of a rectangle and triangle, the circumference and area of a circle, the area of a parallelogram and trapezium. Calculate the perimeter and area of a rectangle and triangle, the circumference and area of a circle, the area of a parallelogram and trapezium. Calculate the volumes of cuboids, prisms and cylinders. Calculate the surface area of a cuboid and a cylinder. Find arc length and sector area as fractions of the circumference and area of a circle.
Geometrical terms and relationships	Use and interpret the geometrical terms; point line, parallel, right angle, acute, obtuse and reflex angles, perpendicular and congruence. Recognise and solve problems involving parallel lines, transversal, congruent angles; corresponding, alternate, vertically opposite and allied angles.
Symmetry	Identify line symmetry in two dimensions and the properties of triangles, quadrilaterals and circles directly related to their symmetries.
Angle properties	Calculate unknown angles using the following geometric properties: a) angles at a point b) angles on a straight line and intersecting straight lines c) angle properties of triangles and quadrilaterals. Discover and then calculate unknown angles using the angle properties of regular and irregular polygons.

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Algebra	Expand the products of algebraic expressions. Factorize expressions of the form: $Ax + bx + kay + kby$, $a^2x^2 - b^2y^2$, $a^2 + 2ab + b^2$, $ax^2 + bx + c$. Manipulate algebraic fractions. Factorize and simplify algebraic expressions.
The straight line	Find the equation of a straight line in the form $y=mx + c$, the equation of a straight line parallel to a given line, the gradient of a straight line from two points on it, the length of a straight line and the coordinates of a mid-point from its end points. Transform complicated formulae and equations.
Algebra	Solve linear equations, linear inequalities, simultaneous linear equations and quadratic equations. Solve word problems involving linear and simultaneous linear equations.
Graphs of functions	Construct table of values for functions of the form $f(x) = ax + b$ $f(x) = x^2 + ax + b$, $f(x) = \frac{a}{x}$ ($x \neq 0$) where a and b are integral constants. Use the table of values to draw graphs and interpret such graphs; intersect on axes, maximum and minimum points and use graphs to solve equations in the form $x^2 + ax + b = k$
Statistics and Probability	Collect data and construct frequency tables; represent data on bar charts, pictograms, and pie charts; calculate the mean, median and mode for sets of data. Interpret bar and pie charts. Understand and use probability scale from 0 to 1, calculate probability of a single event. Use possibility diagrams to calculate the probability of simple combined events.

EXAMINATION CRITERIA IGCSE (GRADE 9)

SECTION A

20 Multiple choice questions

Candidates should answer all questions

Weighting: 40%

SECTION B

Structured Questions (demanding elaborate solutions)

Candidates should answer all questions

Weighting: 60%