

## IGCSE Higher Tier Mathematics Year 3 : Term 1

Topics in **bold** type are IGCSE topics not in the GCSE course.

Topics in *italics* are not examined at IGCSE, but felt to be of sufficient importance to be included should time permit.

Chapter references in brackets refer to the Intermediate text book (lowest set only in Year 3).

Chapter	Topic	Content	Lessons
23 (20, 21a, 23a)	Angles	Labelling angles. Angles round a point and on a straight line. Opposite (X), corresponding (F) and alternate (Z) angles. Angles in a triangle. Angles in a quadrilateral. Bearings.	3
1 (1, 4)	Basic Numeracy	Multiplication. Division. Order of operations. Negative numbers.	4
25b (21b, 23b)	Area	Rectangle, parallelogram, triangle, trapezium. Conversion between units of area e.g. $\text{cm}^2 \leftrightarrow \text{m}^2$ .	2
25a (26)	Circles	Circumference. Area.	3
10, 19a (12, 19a)	Basic Algebra	Letters for numbers. Simplifying expressions. Expanding and factorising with one pair of brackets. Expanding two pairs of brackets.	5
5 (10)	Ratio and Proportion	Equivalent ratios. Sharing in a ratio. Direct proportion. Inverse proportion.	3
36 (36)	Averages	Mode, median, mean (and range). Misleading averages. Calculations involving the mean. Averages from frequency tables. Averages from frequency tables of grouped data.	4
11 (13)	Equations	Equations with the letter on one side. Equations with the letter on both sides. Equations with brackets. Using equations to solve problems.	5
	TEST	Based on term 1 work.	2
			31

	Number		Shape and Space
	Algebra		Handling Data

**IGCSE Higher Tier Mathematics Year 3 : Term 2**

Chapter	Topic	Content	Lessons
2a (2a)	Decimals	Place value. Addition, subtraction, multiplication, division.	2
40a (40a)	Probability	Equally likely outcomes. Expected number of successes. Possibility space diagrams. Relative frequency. Two-way tables.	3
12a, 14 (14a, 15)	Formulas	Substituting into expressions and formulas. $n^{\text{th}}$ term of a sequence. Formulas from growth patterns.	4
30a (29b)	Volume	Cuboid, prism, cylinder. Conversion between units of volume e.g. $\text{cm}^3 \leftrightarrow \text{m}^3$ .	3
3, 31a (3, 33c)	Rounding	Decimal places. Significant figures. Estimation. Upper and lower bounds.	4
27 (28)	Transformations	Reflection. Rotation. Enlargement ( <i>negative scale factors optional</i> ). Translation. Combined transformations.	5
32b (30)	Similar Shapes	Scale factors.	2
	TEST	Based on term 2 work.	2
			25

**IGCSE Higher Tier Mathematics Year 3 : Term 3**

<b>Chapter</b>	<b>Topic</b>	<b>Content</b>	<b>Lessons</b>
28 (31)	Pythagoras	Pythagoras' theorem. Pythagoras' theorem in three dimensions.	4
2b (7)	Fractions	Equivalent fractions. Improper fractions and mixed numbers. Addition, subtraction, multiplication, division. Fractions on a calculator.	4
4 (8)	Percentages	Converting between fractions, decimals and percentages. Finding a percentage of an amount. Percentage change (finding the final amount, the percentage change, or the initial amount). Simple interest and compound interest.	5
	EXAM	Based on all Year 3 work.	8
29a (32)	Trigonometry	Sine, cosine and tangent with right-angled triangles. Practical applications e.g. bearings.	4
7 (6)	Standard Form	Converting numbers to and from standard form. Addition, subtraction, multiplication, division. Standard form on a calculator	3
			28

**IGCSE Higher Tier Mathematics Year 4 : Term 1**

Chapter	Topic	Content	Lessons
6a	Factors and Primes	Factors and primes. Prime factorisation. Using prime factorisation to find highest common factor, lowest common multiple, roots.	3
15	Straight-line Graphs	Horizontal and vertical lines. Gradient and y-intercept method ( $y = mx + c$ ). Cover-up method ( $ax + by = c$ ). Parallel lines. The equation of a line through two given points.	5
20	Simultaneous Equations	Solving by elimination. Solving problems using simultaneous equations. Solving by graphs.	4
23b	Polygons	Angle sum of polygons. Regular polygons. Interior and exterior angles.	3
29b	Trigonometry in Three Dimensions	Review of Pythagoras and trigonometry. The angle between two lines. The angle between a line and a plane.	4
8, 16	Speed and Travel Graphs	Speed, distance and time. Interpreting and drawing travel graphs.	4
31b	Accuracy	Upper and lower bounds of calculations. Accuracy of calculations. Coincidence of calculations.	3
40b	Tree Diagrams	The AND (multiplication) rule. Tree diagrams, including 'without replacement' problems.	2
26	Constructions	Perpendicular and angle bisectors. Construction of triangles and quadrilaterals. Construction of $90^\circ$ , $60^\circ$ , $45^\circ$ and $30^\circ$ angles.	3
	TEST	Based on term 1 work.	2
			33

**IGCSE Higher Tier Mathematics Year 4 : Term 2**

Chapter	Topic	Content	Lessons
12b	Rearranging Formulas	Rearranging simple formulas. Rearranging formulas where the new subject is negative and/or in the denominator. Rearranging formulas involving powers and roots. Rearranging formulas where the new subject appears twice.	4
17	Inequalities	Inequality signs. Inequalities on the number line. Solving inequalities. Regions expressed as inequalities (using horizontal and vertical lines, $y = mx + c$ ) and 'cover-up'.	4
39	Cumulative Frequency	Quartiles. Review of averages. Cumulative frequency.	3
38	Histograms	Drawing histograms. Interpreting histograms.	3
18	Graphs	Shapes of quadratic, cubic, reciprocal and exponential graphs. Sketching graphs from tables of values. Graphical solution of equations.	3
6b	Indices	Laws of indices. Zero, negative and fractional indices. Index equations.	4
32a	Similar Shapes 2	Review of similar shapes (length scale factors). Area and volume scale factors.	4
	TEST	Based on term 2 work.	2
			27

**IGCSE Higher Tier Mathematics Year 4 : Term 3**

Chapter	Topic	Content	Lessons
	<b>Sets</b>	<b>Set notation.</b> <b>Venn diagrams.</b> <b>Solving problems using sets.</b>	<b>5</b>
30b	Area and Volume	Length of an arc. Area of a sector. Volume of cylinder, pyramid, cone, sphere. Surface area of cylinder, cone, sphere.	5
33	Vectors	Translations. Vector basics. Vector geometry.	4
	EXAM	Based on Year 3 and 4 work.	8
13	Proportion	Direct proportion. Other forms of direct proportion e.g. $y \propto x^2$ . Inverse proportion.	3
24	Circle Theorems	Isosceles triangles in circles. Angle between tangent and radius. Angle in a semicircle. Angle at the centre. Angles on the same arc. Cyclic quadrilaterals. Alternate segment theorem. Geometrical proofs. <b>Intersecting chord theorems.</b>	6
			31

**IGCSE Higher Tier Mathematics Year 5 : Term 1**

Chapter	Topic	Content	Lessons
19	Quadratic Equations	Expanding. Factorising. Solving quadratic equations by factorising. Solving quadratic equations using $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ . Solving problems using quadratic equations. <b>Quadratic inequalities.</b>	7
34a	Trigonometric Functions	This topic can be omitted if time is short. The basic requirement is an understanding that the equation $\sin x = k$ , where $k$ is positive, has an acute and an obtuse solution. This can be covered in the following topic.  Review of sine, cosine and tangent. The unit circle. Graphs of sine, cosine and tangent functions up to $180^\circ$ and then for all angles. <i>Trigonometric equations.</i>	4
34b	Sine and Cosine Rules	Sine rule (including ambiguous case). Cosine rule. Applications of the sine and cosine rules. Area of a triangle : $A = \frac{1}{2}ab\sin C$ . Area of a segment.	5
21a	Algebraic Fractions	Simplifying algebraic fractions. Multiplication, division, addition, subtraction. Solving equations with algebraic fractions.	4
20b	Simultaneous Equations 2	<i>Equation of a circle.</i> One linear equation and one non-linear equation. Intersection of a straight line and a curve.	3
2c, 9b	Recurring Decimals and Surds	Recurring decimals. Simplifying surds. Rationalising the denominator.	3
	<b>Functions</b>	<b>Function notation.</b> <b>Domain and range.</b> <b>Composite function.</b> <b>Inverse functions.</b>	<b>5</b>
	Mock Preparation	Practice papers.	2
			33

**IGCSE Higher Tier Mathematics Year 5 : Term 2**

Chapter	Topic	Content	Lessons
	MOCKS		6
	Differentiation	The gradient function. Differentiation of $y = x^n$ . Turning points. Tangents. Displacement, velocity and acceleration.	8
			14

A revision programme occupies the remaining time in term 2, and this is followed by past paper practice into term 3.