Mathematics: Geometry Grade Ladder

Year 7	Year 8	Year 9	IGCSE: Year 10 and 11
		9A*	**9A* / 8A***
		• Use sine, cosine and tangent of angles of any size. • Use Pythagoras' theorem. • Solving right-angle triangle problems in two and three dimensions. • Use the conditions for congruent triangles in formal geometric proofs [for example, to prove that the base angles of an isosceles triangle are equal]. • Calculate lengths of circular arcs and areas of sectors • Calculate the surface area of cylinders. • Appreciate the continuous nature of scales that are used to make measurements.	• Use the sine, cosine rules for triangles which are not right angled in 2D and 3D. • Apply the trigonometric rules with bearings and any triangle. • Solve complex problems involving vectors, in particular being able to show points are collinear.
	9A*	**8A***	**8A / 7A**
	• Use mathematical similarity in simple 2-D shapes. • Use sine, cosine and tangent ratios in right-angled triangles in two dimensions. • Construct scale drawings.	• Understand and use mathematical similarity in simple 2-D shapes. • Use sine, cosine and tangent ratios in right-angled triangles in two dimensions.	• Use sine, cosine and tangent of angles of any size, and Pythagoras' theorem when solving problems in two and three dimensions. • Use the conditions for congruent

	• Perform length and area calculations of composite shapes. • Calculate the volume of triangular prisms and cylinders.	• Construct scale drawings. • Perform length and area calculations of composite shapes. • Calculate the volume of triangular prisms and cylinders.	triangles in formal geometric proofs • Calculate lengths of circular arcs and areas of sectors • Calculate the surface area of cylinders. • Appreciate the continuous nature of scales that are used to make measurements. • Know and use all of the circle theorems, including some proofs. • Explain reasoning when solving angle problems. • Calculate the volume and surface area of curved shapes such as spheres.
9A*	**8A***	**8A / 7A**	**6B / 5B**
• Enlarge a shape by a positive fractional scale factor, through a given centre of enlargement. • Understand the concepts of error bounds and find them. • Understand and use compound measures like speed and density. • Solve problems involving length and area of parallelograms, rhombuses and kites.	• Understand and apply Pythagoras' Theorem. • Understand and use three figure bearings to define direction. • Enlarge a shape by a positive fractional scale factor, through a given centre of enlargement. • Understand the concepts of error bounds and find them. • Understand and use compound measures like speed and density. • Solve problems involving length	• Understand and apply Pythagoras' Theorem. • Understand and use three figure bearings to define direction. • Enlarge a shape by a positive fractional scale factor, through a given centre of enlargement. • Understand the concepts of error bounds and find them. • Understand and use compound measures like speed and density. • Solve problems involving length	• Understand and use mathematical similarity in simple 2-D shapes. • Use sine, cosine and tangent ratios in right-angled triangles in two dimensions. • Construct scale drawings. • Perform length and area calculations of composite shapes. • Calculate the volume of triangular prisms and cylinders. • Solve angle problems, including

	and area of parallelograms, rhombuses and kites.	and area of parallelograms, rhombuses, kites and circles.	with the use of circle theorems. ● Describe simple vectors and show vectors are parallel.
8A*	**8A / 7A**	**6B / 5B**	**5C / 4C**
● Recognise and use rotational symmetry, its order and centre. ● Know and use angle properties and symmetry properties of triangles and quadrilaterals. ● Classify and define types of quadrilaterals. ● Enlarge a shape by a positive integer scale factor through a given centre of enlargement. ● Understand and use angle properties of intersecting and parallel lines. ● Calculate composite areas involving squares, rectangles and triangles. ● Calculate composite volumes involving cubes and cuboids. ● Calculate the surface area of cubes and cuboids.	● Recognise and use rotational symmetry, its order and centre. ● Know and use angle properties and symmetry properties of triangles and quadrilaterals. ● Classify and define types of quadrilaterals. ● Enlarge a shape by a whole number scale factor through a given centre of enlargement. ● Understand and use language associated with the circle, such as circumference, radius, diameter, arc and chord. ● Understand and use angle properties of intersecting and parallel lines. ● Construct triangles, using protractor, ruler and pair of compasses. ● Calculate composite areas involving squares, rectangles and triangles. ● Calculate composite volumes involving cubes and cuboids. ● Calculate the surface area of cubes and cuboids.	● Recognise and use rotational symmetry, its order and centre. ● Know and use angle properties and symmetry properties of triangles and quadrilaterals. ● Classify and define types of quadrilaterals. ● Enlarge a shape by a whole number scale factor through a given centre of enlargement. ● Understand and use language associated with the circle, such as circumference, radius, diameter, arc and chord. ● Understand and use angle properties of intersecting and parallel lines. ● Construct triangles, using protractor, ruler and pair of compasses. ● Calculate composite areas involving squares, rectangles and triangles. ● Calculate composite volumes involving cubes and cuboids. ● Calculate the surface area of cubes and cuboids.	● Understand and apply Pythagoras' Theorem. ● Understand and use three figure bearings to define direction. ● Enlarge a shape by a positive fractional scale factor, through a given centre of enlargement. ● Understand the concepts of error bounds and find them. ● Understand and use compound measures, including speed and density. ● Carry out calculations involving length and area of parallelograms, rhombuses, kites and circles.

8A / 7A	6B / 5B	5C / 4C	3D
• Understand congruence of 2-D shapes. • Investigate properties of triangles and quadrilaterals • Measure and draw angles up to 360° with reasonable accuracy. • Draw nets to make simple 3-D shapes. • Reflect a shape in a line. • Understand and use scale in the context of maps and drawings. • Calculate areas of squares, rectangles and right angle triangles • Calculate volumes of cubes and cuboids. • Convert one metric unit to another.	• Understand congruence of 2-D shapes. • Investigate properties of triangles and quadrilaterals • Measure and draw angles up to 360° with reasonable accuracy. • Draw nets to make simple 3-D shapes. • Reflect a shape in a line. • Understand and use scale in the context of maps and drawings. • Calculate areas of squares, rectangles and right angle triangles • Calculate volumes of cubes and cuboids. • Convert one metric unit to another.	• Understand congruence of 2-D shapes. • Investigate properties of triangles and quadrilaterals • Measure and draw angles up to 360° with reasonable accuracy. • Draw nets to make simple 3-D shapes. • Reflect a shape in a line. • Understand and use scale in the context of maps and drawings. • Calculate areas of squares, rectangles and triangles • Calculate volumes of cubes and cuboids. • Convert one metric unit to another.	• Recognise and use rotational symmetry, its order and centre. • Know and use angle properties and symmetry properties of triangles and quadrilaterals. • Classify and define types of quadrilaterals. • Enlarge a shape by a whole number scale factor through a given centre of enlargement. • Understand and use language associated with the circle, such as circumference, radius, diameter, arc and chord. • Understand and use angle properties of intersecting and parallel lines. • Construct triangles, using protractor, ruler and pair of compasses. • Calculate composite areas and volumes involving squares, rectangles, triangles, cubes and cuboids. They calculate the surface area of cubes and cuboids.
6B / 5B	**5C / 4C**	**3D**	**3E / 2E**
• Make simple 2D and 3D shapes. • Understand and use language	• Make simple 2D and 3D shapes. • Understand and use language	• Make simple 2D and 3D shapes. • Understand and use language	• Understand congruence of 2-D shapes.

associated with line and angle. ● Understand the relationship between metric units. ● Find perimeters of simple shapes, find areas by counting squares and find volumes by counting cubes. ● Begin to make sensible estimates using standard units in relation to everyday situations.	associated with line and angle. ● Understand the relationship between metric units. ● Find perimeters of simple shapes, find areas by counting squares and find volumes by counting cubes. ● Begin to make sensible estimates using standard units in relation to everyday situations.	associated with line and angle. ● Understand the relationship between metric units. ● Find perimeters of simple shapes, find areas by counting squares and find volumes by counting cubes. ● Begin to make sensible estimates using standard units in relation to everyday situations.	● Investigate properties of triangles and quadrilaterals ● Measure and draw angles up to 360° with reasonable accuracy. ● Draw nets to make simple 3-D shapes. ● Reflect a shape in a line. ● Understand and use scale in the context of maps and drawings. ● Calculate areas of squares, rectangles and right angle triangles and volumes of cubes and cuboids. ● Convert one metric unit to another.
5C / 4C	**3D**	**3E / 2E**	**2F / 1F**
● Name and describe common 2D and 3D shapes, using appropriate mathematical language. ● Identify lines of symmetry in simple 2-D shapes. ● Understand angle as a measurement of turn and recognise right angles in the environment. ● Use standard units to measure length, mass, capacity and time in a range of contexts. ● Use a range of units and instruments, interpreting, with	● Name and describe common 2D and 3D shapes, using appropriate mathematical language. ● Identify lines of symmetry in simple 2-D shapes. ● Understand angle as a measurement of turn and recognise right angles in the environment. ● Use standard units to measure length, mass, capacity and time in a range of contexts. ● Use a range of units and instruments, interpreting, with	● Name and describe common 2D and 3D shapes, using appropriate mathematical language. ● Identify lines of symmetry in simple 2-D shapes. ● Understand angle as a measurement of turn and recognise right angles in the environment. ● Use standard units to measure length, mass, capacity and time in a range of contexts. ● Use a range of units and instruments, interpreting, with	● Make simple 2D and 3D shapes. ● Understand and use language associated with line and angle. ● Understand the relationship between metric units. ● Find perimeters of simple shapes, find areas by counting squares and find volumes by counting cubes. ● Begin to make sensible estimates using standard units in relation to everyday situations.

reasonable accuracy, numbers on a range of measuring instruments.	reasonable accuracy, numbers on a range of measuring instruments.	reasonable accuracy, numbers on a range of measuring instruments.	
3D	**3E / 2E**		**1G**
• Sort 2D and 3D shapes in various ways and give reasons for sorting. • Name common 2D shapes. • Measure length, mass, capacity and area and recognise standard units. • Know the metric units of length, mass, capacity and time. • Read times on the analogue clock and the date from a calendar.	• Sort 2D and 3D shapes in various ways and give reasons for sorting. • Name common 2D shapes. • Measure length, mass, capacity and area and recognise standard units. • Know the metric units of length, mass, capacity and time. • Read times on the analogue clock and the date from a calendar.		• Name and describe common 2D and 3D shapes, using appropriate mathematical language. • Identify lines of symmetry in simple 2-D shapes. • Understand angle as a measurement of turn and recognise right angles in the environment. • Use standard units to measure length, mass, capacity and time in a range of contexts. • Use a range of units and instruments, interpreting, with reasonable accuracy, numbers on a range of measuring instruments.
3E / 2E			**U**
• Make constructions with 2-D and 3D shapes. • Measure and order objects using direct comparison and use appropriate language associated with length, mass,			Learners lack the basic foundations in order to calculate and solve problems involving geometry.

capacity and area.	[redacted]	