

## Expected mathematical knowledge for entrants to the 5L

Number sets	<p>Definitions of the sets <math>\mathbb{R}</math>, <math>\mathbb{Q}</math>, <math>\mathbb{Z}</math> and <math>\mathbb{N}</math>.</p> <p>Definition of the set of Irrational numbers.</p> <p>The relationship between the sets.</p> <p>Representing numbers on number lines, as sets etc.</p>
Arithmetic	<p>The rules governing the four operators <math>+</math>, <math>-</math>, <math>\times</math> and <math>\div</math>.</p> <p>Square numbers, cube numbers, square roots of square numbers.</p> <p>Calculations with fractions.</p>
Percentages	<p>Calculating compound and simple interest.</p> <p>Calculating price reductions.</p> <p>Borrowing and repayment rates.</p>
Geometry	<p>Right angled triangles: Pythagoras' theorem.</p> <p>Plane shapes: triangles, squares, rectangles, polygons and circles.</p> <p>Calculating the areas and perimeters of plane shapes.</p> <p>Definitions: sector, segment and ring.</p> <p>Solid shapes: Prisms and pyramids, cylinders, cones and spheres.</p> <p>Drawing the nets of 3D shapes.</p> <p>Volumes and surface areas.</p>
Algebra	<p>Calculations with expressions and equations containing unknown terms.</p> <p>The binomial expansion to degree 3.</p> <p>Algebraic fractions, including fractions in the denominator.</p> <p>Linear equations in one variable.</p> <p>Rearranging formulae and evaluating by substituting values.</p> <p>Linear equations in two variables: solving graphically or algebraically.</p>
Functions	<p>Definition.</p> <p>Linear functions: direct proportionality.</p> <p>Exponential functions: growth and decay.</p> <p>Simple rational functions: indirect proportionality.</p>
Statistics	<p>Representing data: plots, charts and graphs.</p> <p>Mean, median, mode, maximum, minimum and range.</p>