

## Prior learning topics

### Numbers and algebra

- Manipulation of algebraic expressions, including factorization and expansion
- Laws of exponents, including integer and negative exponents
- Operations with radicals
- Scientific notation:  $a \times 10^k$ ,  $1 \leq a < 10$ ,  $k \in \mathbb{Z}$
- Linear equations and inequalities
- Quadratic equations and inequalities
- Solving systems of equations with two variables
- Arithmetic and geometric sequences
- Concept and basic notation of sets. Operations on sets: union and intersection
- Algebraic fractions.

### Functions

- Linear functions, gradient and intercepts, graphing linear functions
- Gradient of parallel and perpendicular lines
- Graphing quadratic functions
- Transformation of quadratic functions
- Mappings of the elements of one set to another. Illustration by means of sets of ordered pairs, tables, diagrams and graphs.

### Geometry and trigonometry

- Pythagoras' theorem and its converse
- Mid-point of a line segment and the distance between two points in the Cartesian plane
- Properties of special triangles – isosceles and equilateral triangles
- Congruent and similar triangles
- Perimeter and area of plane figures. Properties of triangles and quadrilaterals, including parallelograms, rhombuses, rectangles, squares, kites and trapezoids; compound shapes
- Right-angle trigonometry, including simple applications for solving triangles
- Three-figure bearings
- Simple geometric transformations: translation, reflection, rotation, enlargement
- The circle, its centre and radius, area and circumference. The terms diameter, arc, sector, chord, tangent and secant
- Circle theorems
- Volumes and surface areas of prisms, cylinders, cones, pyramids, spheres and compound three-dimensional shapes

### Statistics and probability

- The collection of data and its representation in bar charts, pie charts, pictograms, dot plots, stem and leaf plots, line graphs, box-and-whisker plots
- Obtaining simple statistics from discrete data, including mean, median, mode, range
- Lines of best fit
- Data processing: quartiles and interquartile range

- Cumulative frequency graph
- Calculating probabilities of simple events
- Addition and multiplication rule — conditional probability
- Combined events; independent and dependent events
- Venn diagrams for sorting data
- Probability with Venn diagrams, tree diagrams and sample spaces