

## 9<sup>th</sup> Grade Integrated Mathematics, Higher Level

### Knowledge Content

- **Number:** sets
- **Algebra:** formulae, equations, inequations, algebraic fractions, surds and indices, simultaneous equations, variation, linear programming, kinematics, matrices
- **Shape:** surface area, volume, arc length and sector area, circle theorems, loci, vectors, transformations in a Cartesian plane
- **Handling data:** grouped data, cumulative frequency polygons, histograms and relative frequency histograms, measures of location and dispersion.

### Skills Content

- Using linear and simultaneous linear equations to solve real life problems
- Calculating arc lengths, areas of sectors and segments
- Calculating the volumes and surface areas of prisms, pyramids, cones and spheres
- Applying circle theorems and constructing loci
- Rearranging formulae, formulating direct and inverse variation formulae, solving inequalities and application to linear programming problems
- Plotting and interpreting a range of functions, solving equations graphically, constructing and interpreting kinematics graphs
- Recognising set notation and finding intersections, unions, complements and subsets and representing these on Venn diagrams. Using Venn diagrams to solve a range of logic problems
- Representing vectors on a Cartesian plane. Combining scalar multiples of vectors and application to geometric arrangements
- Deducing composite and inverse functions
- Performing matrix operations, finding the determinant and inverse of a 2x2 matrix. Using matrices to perform transformations in the Cartesian plane
- Constructing histograms, relative frequency histograms, cumulative frequency polygons and step polygons for individual and grouped data
- Summarising sample data through the calculation of the mean, median, mode and quantiles and constructing box plots
- Calculating the range, interquartile range, variance and standard deviation of frequency distributions and interpreting results
- Applying the addition and multiplication rules of probability
- Constructing and working with tree diagrams
- Determining independent and mutually exclusive events.

### Assessment

#### Departmental tools of assessment:

- Major test
- Unit test
- Project
- Investigation
- Quiz
- Assignment
- Homework.

### Examinations

Internal (as specified under assessment) and external (ISA).

### Resources

- Rayner, D., *Extended Mathematics for IGCSE*. Oxford, 2005
- Attwood, G., *Statistics 1 (S1)*. Heinemann, 2004.

### Prerequisites

8<sup>th</sup> Grade Integrated Mathematics, Higher Level (or equivalent) – 4 or above.

### Credits

**One Credit.**