

# THE CURRICULUM FRAMEWORK FOR MATHEMATICS

Mathematics should develop students' abilities to manipulate numbers and solve a range of numerical problems. It should allow students to interpret charts and tables and to understand the concepts of numbers and shapes. Although mental arithmetic strategies are key skills in Mathematics they will not be assessed in these tests. It is, however, assumed that they will play an important role in developing students' skills in Mathematics and, as such, have been included in the Curriculum Framework. As one paper permits the use of a calculator and the other does not it is important that students are able to solve problems in both situations.

## NUMBER

### Properties

Students should:

- Np1 understand place value in whole numbers and decimals;
- Np2 use the four rules of computation for calculations;
- Np3 understand the relationship between decimals, fractions and percentages and be able to convert between them;
- Np4 use prime numbers, common factors and common multiples, squares, square roots and cubes of numbers;
- Np5 order quantities by magnitude and be familiar with the symbols =, ≠, >, <, ≥, ≤;
- Np6 use the standard form  $A \times 10^n$  where  $n$  is a positive whole number and  $1 \leq A < 10$ .

### Problem Solving

Students should:

- Ns1 calculate the percentage of a quantity; express one quantity as a percentage of another;
- Ns2 use negative numbers in context;
- Ns3 recognise the notation of ratio, use ratio and direct proportion in context;
- Ns4 understand approximation to specified numbers of significant figures and decimal places; give appropriate upper and lower bounds for data given to specified accuracy;
- Ns5 understand how to use an electronic calculator effectively;
- Ns6 handle number manipulation mentally and show evidence of performing calculations without the aid of a calculator.

### Data handling

Students should:

- Nd1 collect and tabulate discrete and continuous data, representing it on bar charts, pictograms, pie charts and frequency diagrams;
- Nd2 calculate the mean, median, mode and range for discrete and continuous data;
- Nd3 calculate the probability of a single event.

## ALGEBRA

### Manipulation

Students should:

- An1 use letters to represent unknowns, substitute in a formula and transform simple formulae;
- An2 find the solution of linear, simple simultaneous and quadratic equations using algebraic manipulation;
- An3 demonstrate the understanding of simple inequalities;
- An4 manipulate directed numbers; use brackets and extract common factors;
- An5 use and interpret positive indices.

### Graphs

Students should:

- Ag1 draw and interpret the graphs of simple functions, use tables of values and find the gradient of straight line graphs;
- Ag2 draw and interpret graphs in practical situations;
- Ag3 use Cartesian co-ordinates;
- Ag4 find the solution of linear and simple simultaneous equations using graphs;
- Ag5 recognise, continue and generalise number patterns including finding expressions for the  $n^{\text{th}}$  term.

## SPACE

### Measure

Students should:

- Sm1 use standard units of mass, length, area, volume and capacity; express quantities in terms of larger or smaller units;
- Sm2 calculate times in terms of the 24-hour and 12-hour clock systems;
- Sm3 calculate using money; solve problems on personal and household finance involving simple interest, discount, profit and loss;
- Sm4 calculate average speed and other compound measures;
- Sm5 calculate the perimeter and area of triangles, quadrilaterals and circles, and the volumes derived from these shapes.

## **Geometry**

Students should:

- Sg1 use and interpret the geometric terms: point, line, parallel, bearing, right angle, acute angle, use and interpret the vocabulary of triangles, quadrilaterals, circles and polygons;
- Sg2 calculate unknown angles using the properties of angles at a point, angles formed within parallel lines and angle properties of triangles and quadrilaterals;
- Sg3 construct, using appropriate equipment, simple 2D shapes and the nets of simple 3D shapes;
- Sg4 understand the concepts of reflection, rotation and symmetry in two dimensions including enlargement by a positive whole number scale factor;
- Sg5 plot the locus of an object moving according to given rules.

## **Trigonometry**

Students should:

- St1 use Pythagoras' Rule;
- St2 use trigonometric ratios within right angled triangles to solve problems.

## TEST SPECIFICATION FOR MATHEMATICS

Mathematics will be assessed using two papers. Each paper will be taken in an hour long session.

Questions will be set on the Number, Algebra and Space sections of the Curriculum Framework in both papers.

Both papers will contain short structured questions totalling 50 marks. The questions will demand a variety of skills including recall of information and application of Mathematical knowledge.

All the questions on both papers will be compulsory. As far as possible the questions will be arranged in difficulty through each paper.

The use of an electronic calculator (or Tables) will be allowed for Paper 2 but **not** for Paper 1.