



QUI FACIT PER ALIUM FACIT PER SE

THE PERSE

UPPER SCHOOL

CAMBRIDGE

Year 9 Entrance Exams

Maths Syllabus

Candidates are required to work one paper of sixty minutes duration.

There is no choice of questions; candidates should answer as many questions as possible. Answers and working are to be shown on the question paper itself. Mathematical tables and calculators are not permitted.

It is expected that candidates will have had some experience of investigative thinking; the examination will allow for the demonstration of such techniques.

Puzzle and problem solving type questions will also be included.

The test may also contain questions in which a new mathematical concept or rule is explained and examples given, before asking candidates to apply this new idea. No knowledge beyond this specification will be required.

1. Calculation using the four operations $+$, $-$, \times \div applied to positive integers, negative integers, fractions (inc. mixed numbers) and decimals. Exact division by decimals. Simple recurring decimals.

2. Approximation - significant figures/decimal places

3. Indices - to be able to understand and evaluate numbers written in index form (positive integral indices only) Standard index form with positive and negative powers of 10.

4. Percentages - expressing a percentage as a fraction, conversion of a fraction to a percentage. Writing a quantity as a percentage of another. Finding a percentage of a quantity.

5. Averages - calculation of mean. More difficult problems may be set involving change of mean through the addition/deletion of a value.

6. Concept of negative number - addition, subtraction, multiplication and division of negative numbers.
Number sequences.

7. Units of measurement - length, area, volume, speed, temperature. Conversion between units (problems may also be set on conversion of currencies)

Units of length - millimetre (mm), centimetre (cm), metre (m),
kilometre (km)

Units of mass - gram (g), kilogram (kg), tonne (t)

Units of capacity - millimetre (ml), litre (l)

8. Area - area of a triangle, rectangle, parallelogram and compound shapes. Units of area (inc. conversion between units)

9. Volume - volume of a cuboid. Units of volume. (inc. conversion between units)

10. Circle - calculation of area and circumference (pupils will be expected to know the formulae $C = 2\pi r$; $A = \pi r^2$)

11. Algebra - including use of brackets and positive indices. Simplifying simple algebraic expressions. Solving straightforward equations and inequations in one variable - to include brackets and fractional coefficients.

12. Squares, cubes, square roots and cube roots.

13. Rectangular co-ordinates in all four quadrants. Equations of lines parallel to the axes and straightforward lines through the origin. Reflections in lines. Rotations about grid points through 90° or 180° .

14. Angles - acute, obtuse, and reflex. Angle properties of intersecting and parallel lines.(Vertically opposite angles, alternate and corresponding angles) Angle sum of a triangle and a quadrilateral. Angle properties of equilateral and isosceles triangles.

15. Factors, multiples, primes and prime factors.

16. Ratios - equivalence with fractions, decimals and percentages. Simplifying ratios, division in a given ratio, problems on direct proportion e.g. maps.