Subject: Mathematics

Year 10 Higher

OVERVIEW

Students study topics in each of the five key strands in mathematics: Number, Algebra, Geometry, Ratio & Proportion and Statistics & Probability. Each strand builds on their prior learning from Years 7, 8, and 9.

We focus on developing knowledge and skills in each of the five strands which students will then build on to solve problems and reason mathematically.

Autumn

10.01: Rearranging – one step rearranging, multi-step rearranging, rearranging with fractions, with negative unknowns, subjects in the denominator and with unknowns on both sides

10.02: Linear Graphs – coordinates, midpoint, horizontal and vertical lines, drawing straight line graphs, real life graphs.

10.03: Gradient and y-intercept – identifying gradients and y-intercepts, finding the equation from a graph, finding the equation from gradient and coordinates, parallel and perpendicular lines and find the equation of a tangent to a circle.

10.04: Compound Measures – calculating speed distance and time, calculating average speed, distance time graphs, calculating density mass and volume, calculating force pressure and area

10.05: Quadratic graphs – drawing quadratics, identifying roots solutions and turning points, finding roots, lines of symmetry, finding turning points

Assessment:

Students will be informally assessed every lesson using questioning and marking of independent work.

Students will be assessed at the end of every topic using Edexcel GCSE questions.

Spring

10.06: Expanding and Factorising – expanding triple brackets, factorizing quadratics with a coefficient greater than 1, solving algebraic fractions, four operations with algebraic fractions, completing the square

10.07: Linear simultaneous equations – solving linear simultaneous equations using rearranging and the substitution method, solving linear and quadratic simultaneous equations graphically.

11.02: Solving Quadratics and Further Simultaneous Equations – solving by factorizing, solving using the quadratic formula, solving by completing the square, solving quadratics from algebraic fractions, solving linear and nonlinear simultaneous equations

10.09: Probability – probability scale, listing, single event probability, relative frequency, expected outcomes, frequency trees, product rule for counting, Venn diagrams and tree diagrams.

10.10: Standard form – writing numbers in standard form, four operations with standard form

10.11: Further proportion – linear and non-linear direct proportion, linear and non-linear inverse proportion, proportion tables, complex further proportion

10.12: Growth and decay – simple interest, compound interest, comparing compound and simple interest, depreciation, exponential growth and decay

10.13: Further ratio – equivalent ratio, ratios to fractions, sharing in a given ratio, combining ratios, splitting ratios, problem solving with ratio.

Assessment:

Mid-Year assessments will take place in January.

Students will be informally assessed every lesson using questioning and marking of independent work.

Students will be assessed at the end of every topic using Edexcel GCSE questions.

Summer

10.15: Statistics – types of data, sampling, mode median and range, mean, problem solving with mean, combining mean, comparing averages, averages and range from a frequency table, mean from a frequency table, mean from a grouped frequency table, pie charts, scatter graphs, frequency polygon

10.16: Surds – simplifying, four operations with surds, expanding and simplifying, rationalising with a single surd, rationalising with an expression, perimeter and area

10.17: Bounds – finding upper and lower bounds, calculations with bounds, suitable degree of accuracy

10.18: Right angled trigonometry – labelling sides, finding missing side lengths, finding missing angles isosceles triangles, exact trigonometric values

10.19: Similar shapes – finding missing lengths, area of similar shapes, volume of similar solids

10.20: Quadratic sequences - finding terms, finding the nth term

10.21: Plans and elevations – plans and elevations of 3D shapes, sketching 3D shapes from plans and elevations

10.02: Constructions and loci – perpendicular bisectors, angle bisectors, constructing triangles and parallelograms, loci lines, loci regions

11.13: Gradients and area under a graph – equation of a tangent to a circle, interpreting gradients, finding acceleration, estimating distance travelled

Assessment:

Students will be informally assessed every lesson using questioning and marking of independent work.

Students will be assessed at the end of every topic using Edexcel GCSE questions.

End of Year assessments will take place in June.

Useful resources for supporting your child at home:

Videos and worksheets on (https://www.mathsgenie.co.uk/gcse.html)

Videos on Sparx (www.sparxmaths.uk)

Videos on Corbett Maths (Videos and Worksheets – Corbettmaths)

CGP GCSE Maths Edexcel Revision Guide (link here)

Pearson Revise Edexcel GCSE (9-1) Mathematics (link here)

Homework:

Homework will be set on Sparx (www.sparxmaths.uk).

Homework will be set once a week and students are expected to complete 100% of their homework each week. Homework is bespoke for all students depending on their performance in previous weeks.

Students complete shadow copies of Edexcel GCSE papers using modelled solutions.