

## What are the aims and intentions of this curriculum?

The Year 10 curriculum is aimed at preparing students for their GCSE. The curriculum is based on an increase in complexity, depth and range compared to that of KS3 in terms of number operations, algebra, ratio, proportion, rates of change, geometry, measures, probability and statistics. Students receive homework on a weekly basis and it is expected of them to complete it both online and offline. Our vision is for students to ultimately be able to mathematical analyse situations, critically evaluate problems and to deduce plausible accurate solutions. Furthermore, they should be proficient enough in order to access professions and trainings at the highest level.

| Term     | Topics                            | Knowledge and key terms  | Skills developed  | Assessment  |
|----------|-----------------------------------|--|---|---|
| Autumn 1 | <i>Equations and inequalities</i> | Factorise, common factor, difference of squares, trinomial, completing the square, coefficient, surd, rational and irrational, inequalities, greater than/smaller than, equal to, included and excluded. | Use factorization to solve for a quadratic equation in order to find the roots of a given function. Effectively use the quadratic equation in order to find the roots of a given function. Solve quadratic equations by completing the square. Solve quadratic equations by leaving the answer in surd form. Solve complex linear simultaneous equations including real life situations. Solve simultaneous equations with quadratic equations as well as in order to find the equation of a line through the two points of intersection. Solve linear inequalities, showing the solution on a number line. | End of topic review<br>Homework<br>Bookmarking<br>Classroom feedback<br>Half-term formal assessment |
|          | <i>Probability</i>                | Number of outcomes, complementary events, mutually exhaustive, mutually exclusive, relative frequency, biased/unbiased.  | List the outcomes for single and two-event systems. Use the product rule to find the number of outcomes for two or more events. Determine the probability of an event not happening. Identify mutually exclusive events and determine their probabilities. Identify the difference between theoretical and experimental probabilities and calculate each probability. Compare experimental probabilities with theoretical probabilities in order to determine if the results is fair.   |   |
| Autumn 2 | <i>Probability</i>                | Outcomes, possible outcomes, expected outcomes, two-way tables, sets, universal set, union, intersection, subset, superset, sample space.  | Identify dependent and independent events. Draw frequency trees and tree diagrams in order to determine probabilities of dependent and independent events. Determine conditional probability using tree diagrams, two-way tables and Venn diagrams. Link set notation with Venn diagrams.   | End of topic review<br>Homework<br>Bookmarking<br>Classroom feedback<br>Half-term formal assessment |
|          | <i>Multiplicative reasoning</i>   | Substitute, convert, ratio, gradient, inverse, proportion.   | Calculate compound growth and decay. Calculate simple and compound rates in real life. Convert between metric measures of speed. Use formulae to determine speed and acceleration. Convert measure and compound measures in order to solve problems involving compound measures. Link ratios with graphs. Use direct and indirect proportion to solve problems, including quadratic and cubic ratios.   |   |

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|------------------------|--|---|--|--|
| <p><b>Spring 1</b></p> | <p><i>Similarity and congruence</i></p> <p><i>Trigonometry</i></p> | <p>SSS, SAS, ASA, RHS, angles, sides, points, lines, ratio, corresponding, similar, proportional.</p> <p>Round, truncate, error, sine, cosine, tangent, inverse function, angle, intercept, turning point, maximum, minimum, asymptote.</p>   | <p>Prove two triangles are congruent. Solve problems involving the congruency of shapes. Use ratio of corresponding sides, to determine the scale factor. Find the missing lengths of similar shapes, extended to real life problems. Use the link between linear scale factor and area or volume to solve problems.</p> <p>Use upper and lower bounds in trigonometric calculations. Determine the sine, cosine and tangent of any angle and know the graphs of these functions.</p>  | <p>End of topic review<br/>Homework<br/>Bookmarking<br/>Classroom feedback<br/>Half-term formal assessment</p> |
| <p><b>Spring 2</b></p> | <p><i>Trigonometry</i></p> <p><i>Statistics</i></p>                | <p>Arc, sector, area, degrees, ratio, Pythagoras' theorem, hypotenuse, translate vertically/horizontally, stretch/shrink, factor, column vector, function, reflect.</p> <p>Sampling, fraction, ratio, proportion, frequency density, average/middle value, total, number of numbers.</p>                                  | <p>Find the area of a triangle and segment of a circle using trigonometric formulae. Solve problems in 2D and 3D using trigonometry and Pythagoras' theorem. Recognise how changes in the trigonometric functions affect their graphs.</p> <p>Take simple random samples and stratified samples. Draw cumulative frequency tables and ogives. Determine the quartiles and interquartile ranges from stem-and-leaf diagrams and ogives. Draw histograms. Interpret histograms in terms of frequency density. Compare two sets of data in terms of mean, median, mode and range.</p> | <p>End of topic review<br/>Homework<br/>Bookmarking<br/>Classroom feedback<br/>Half-term formal assessment</p> |
| <p><b>Summer 1</b></p> | <p><i>Equations and graphs</i></p> <p><i>Circle Theorems</i></p>   | <p>Solve, substitute, subject of an equation, factorise, roots, turning point, line of symmetry, iteration.</p> <p>Angles on a line, equilateral, scalene, vertically opposite, alternate/co-interior/corresponding angles, parallel, exterior/interior angles, tangent, radius, circumference, chord, perpendicular.</p> | <p>Solve simultaneous equations graphically. Represent inequalities on a graph. Interpret graphs of inequalities to find most/least efficient points. Recognise and draw quadratic functions. Find approximate solutions to quadratic graphs, including the use of iteration. Find the roots of simple cubic equations and sketch these graphs. Solve cubic equations using iteration.</p> <p>Solve problems using angle, triangle, circle and tangent to a circle theorems.</p>   | <p>End of topic review<br/>Homework<br/>Bookmarking<br/>Classroom feedback<br/>Half-term formal assessment</p> |

## Summer 2

### Circle Theorems

Tangent, perpendicular, bisect, radius, angles at the centre of a circle, angles subtended by the same chord/segment, tan-chord theorem, cyclic quadrilateral, angles in a semi-circle.

Prove and use various circle theorems. Find the equation of a tangent to a circle at a given point.

End of topic review  
Homework  
Bookmarking  
Classroom feedback  
Half-term formal assessment

### Algebra

Simplify, factorise, exponent, power, numerator, denominator, reciprocal, exponent laws, lowest common multiple, rationalize, like terms, functions, prove.

Simplify simple and complex algebraic fractions via addition, subtraction, multiplication and division. Rearrange formulae where the subject has a power, appears twice or where all variables are in the denominators. Simplify and expand expressions involving surds. Rationalize denominators. Solve equations containing algebraic fractions. Use function notation in order to find composite and inverse functions. Prove results using algebraic arguments.