

Year 11 Higher Big Picture – Maths

Autumn 1 7 weeks	Autumn 2 7 weeks	Spring 1 7 weeks
<p>Content</p> <p>11.01H Algebraic proof 11.02H Solving quadratics & further simultaneous equations 11.03H Functions 11.04H Iteration 11.05H Further inequalities</p>	<p>Content</p> <p>11.06H Bearings 11.07H Circle Theorems 11.08H Further Trigonometry & Trigonometric graphs Mock PPE exams- revision and preparation Feedforward lessons based on QLAs</p>	<p>Content</p> <p>11.09H Statistics (further) 11.10H Transformations 11.11H Congruence 11.12H Vectors</p>
<p>Assessment Objectives</p> <p>This is the knowledge, application and skills assessed by the Big Test:</p> <ul style="list-style-type: none"> • Language of proof: odd, even, product, sum, integer, consecutive, square, difference etc. • Solve 'Show that' and proof questions using consecutive integers (n, n + 1), squares a², b², even numbers 2n, odd numbers 2n + 1 • Solve quadratic equations algebraically by factorising (no rearrangement required) • Find approximate solutions to quadratic equations using a graph • Solve quadratic equations (that also require rearrangement) by factorising, completing the square and by using the quadratic formula • Solve linear/quadratic simultaneous equations • Solve quadratic equations arising from algebraic fraction equations • Be able to identify from a graph if a quadratic equation has any real roots • Solve linear/circles simultaneous equations • Find f(x) + g(x) and f(x) – g(x), 2f(x), f(3x) etc. algebraically • Find the inverse of a linear function • Know that f⁻¹(x) refers to the inverse function • Composite functions - for two functions f(x) and 	<p>Assessment Objectives</p> <p>This is the knowledge, application and skills assessed by the Big Test:</p> <ul style="list-style-type: none"> • Interpret maps and scale drawings • Estimate lengths using a scale diagram • Make an accurate scale drawing from a diagram • Know and use compass directions • Use three-figure bearings to specify direction • Mark on a diagram the position of point B given its bearing from point A • Give a bearing between the points on a map or scaled plan • Given the bearing of a point A from point B, work out the bearing of B from A • Use accurate drawing to solve bearings problems • Solve locus problems including bearings • Apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and use them to prove related results: <ul style="list-style-type: none"> -the angle subtended by an arc at the centre of a circle is twice the angle subtended at any point on the circumference; -the angle in a semicircle is a right angle; -the perpendicular from the centre of a circle to a chord bisects the chord; -angles in the same segment are equal; 	<p>Assessment Objectives</p> <p>This is the knowledge, application and skills assessed by the Big Test:</p> <ul style="list-style-type: none"> • Draw and interpret Histograms • Cumulative frequency graphs • Draw, interpret and compare box plots • Range, quartiles and inter-quartile range • Reflection and rotation symmetry • Transformations - rotation, reflection, translation, enlargement (with a positive scale factor) • Identify the equation of a line of symmetry • Identify the scale factor of an enlargement of a shape as the ratio of the lengths of two corresponding sides, simple integer scale factors, or simple fractions • Enlargements with a fractional scale factors • Enlargements with negative scale factors • Describe the changes and invariance achieved by combinations of rotations, reflections and translations • Identify congruent shapes by eye • Understand that distances and angles are preserved under reflections, so that any figure is congruent under this transformation • Congruence criteria for triangles (SSS, SAS, ASA, RHS)

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<p>$g(x)$, find $gf(x)$</p> <ul style="list-style-type: none"> Find approximate solutions to equations numerically using iteration Use iteration with simple converging sequences Sketch a graph of a quadratic function, by factorising or by using the formula, identifying roots, y-intercept and turning point by completing the square Solve quadratic inequalities in one variable, by factorising and sketching the graph to find critical values Represent the solution set for inequalities using set notation, i.e. curly brackets and 'is an element of' notation e.g. the solution set of $x^2 - 3x - 10 < 0$ as $\{x: x < -3\} \cup \{x: x > 5\}$ 	<ul style="list-style-type: none"> -alternate segment theorem; -opposite angles of a cyclic quadrilateral sum to 180°; -understand and use the fact that the tangent at any point on a circle is perpendicular to the radius at that point; Sine rule and cosine rule Area of a triangle using trigonometry. Also use to find sides or angles of any triangle Sketch and interpret graphs of the trigonometric functions $y = \sin x$, $y = \cos x$ and $y = \tan x$ Apply sine and cosine rule to questions involving bearings Trigonometry in 3D configurations 	<ul style="list-style-type: none"> Solve angle problems involving congruence Addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors Be able to represent information graphically given column vectors Identify two column vectors which are parallel Solve geometric problems in 2D where vectors are divided in a given ratio Produce geometrical proofs to prove points are collinear and vectors/lines are parallel
<p>Mini test (marked by teacher) UNIT test 11.02H</p>	<p>Mini test (marked by teacher) UNIT test 11.07H</p>	<p>Mini test (marked by teacher) UNIT tests 11.10H</p>
<p>UNIT tests (Self-assessment) UNIT tests 11.01H, 11.03H</p>	<p>UNIT tests (Self-assessment) UNIT tests 11.06H, 11.08H</p>	<p>UNIT tests (Self-assessment) UNIT tests 11.09H, 11.12H</p>
<p>Feedforward and Intervention Students to complete the questions where they made errors (in purple pen)</p>	<p>Feedforward and Intervention Students to complete the questions where they made errors (in purple pen)</p>	<p>Feedforward and Intervention Students to complete the questions where they made errors (in purple pen)</p>
<p>Assessment exams, fluency tests ATL data</p>	<p>Assessment exams, fluency tests PPE exams, ATL data</p>	<p>Assessment exams, fluency tests ATL data</p>
<p style="text-align: center;">Spring 2 5 weeks</p>	<p style="text-align: center;">Summer 1 6 weeks</p>	<p style="text-align: center;">Summer 2 7 weeks</p>
<p>Content 11.13H Gradients (further) and area under a graph 11.14H Kinematics 11.15H Graphical transformations 11.16H Constructions and Loci</p>	<p>Content</p> <ul style="list-style-type: none"> Revision programme GCSE exams 2024 GCSE exams 	<p>Content</p> <ul style="list-style-type: none"> Revision programme for GCSE exams 2024 GCSE exams
<p>Assessment Objectives</p>	<p>Assessment Objectives</p>	<p>Assessment Objectives</p>

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This is the knowledge, application and skills assessed by the Big Test:

- **Recognise and use the equation of a circle with centre at the origin**
- **Find the equation of a tangent to a circle at a given point, by:**
 - finding the gradient of the radius that meets the circle at that point (circles all centre the origin)
 - finding the gradient of the tangent perpendicular to it
 - using the given point
- **Estimate area under a quadratic or other graph by dividing it into trapezia. Interpret the results in cases such distance–time graphs, velocity–time graphs and graphs in financial contexts**
- **Interpret the gradient of linear or non-linear graphs, and estimate the gradient of a quadratic or non-linear graph at a given point by sketching the tangent and finding its gradient**
- **Interpret the gradient of non-linear graph in curved distance–time and velocity–time graphs**
- **Use kinematics formulae from the formulae sheet to calculate speed, acceleration, etc. (with variables defined in the question)**
- **Translations and reflections of functions:**
 - apply to the graph of $y = f(x)$ the transformations $y = -f(x)$, $y = f(-x)$ for linear, quadratic, cubic functions
 - apply to the graph of $y = f(x)$ the transformations $y = f(x) + a$, $y = f(x + a)$ for linear, quadratic, cubic functions
 - apply to the graph of $y = f(x)$ the transformations $y = -f(x)$, $y = f(-x)$ for sine, cosine and tan functions $f(x)$
 - apply to the graph of $y = f(x)$ the transformations $y = f(x) + a$, $y = f(x + a)$ for sine, cosine and tan functions $f(x)$
- Draw circles and arcs to a given radius or given the diameter
- Measure and draw lines, to the nearest mm
- Measure and draw angles, to the nearest degree
- **Use the standard ruler and compass constructions**

This is the knowledge, application and skills assessed by the Big Test:

- Revision of key topics - bespoke plan for each Year 11 Maths class
- Preparation for GCSE exams- practice and exam papers

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<p>(perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle)</p> <ul style="list-style-type: none"> • Construct angles of 90°, 45° • Use constructions to construct given figures and solve loci problems; know that the perpendicular distance from a point to a line is the shortest distance to the line • Construct: a region bounded by a circle and an intersecting line; a given distance from a point and a given distance from a line; equal distances from two points or two line segments; regions which may be defined by 'nearer to' or 'greater than' <p><u>Mini test (marked by teacher)</u> GCSE practice papers</p> <p><u>UNIT tests (Self-assessment)</u> GCSE practice papers</p> <p><u>Feedforward and Intervention</u> Students to complete the questions where they made errors (in purple pen)</p>	<p><u>Mini test (marked by teacher)</u> GCSE practice papers</p> <p><u>UNIT tests (Self-assessment)</u> GCSE practice papers</p> <p><u>Feedforward and Intervention</u> Students to complete the questions where they made errors (in purple pen)</p>	<p><u>Mini test (marked by teacher)</u> n/a</p> <p><u>UNIT tests (Self-assessment)</u> n/a</p> <p><u>Feedforward and Intervention</u> Students to complete the questions where they made errors (in purple pen)</p>
<p>Assessment exams, fluency tests PPE exams, ATL data</p>	<p>GCSE exams 2024</p>	<p>GCSE exams 2024</p>