

Curriculum Overview – Year 11 Maths (Higher)

Week	1	2	3	4	5	6	7
Big ideas (key concepts)	Collecting Data	CF, box plots and histograms	CF, box plots and histograms	Quadratics, expanding, sketching graphs of circles cubes and quadratics		Circle Theorems	
Lesson topics sequence	<p>Understand primary and secondary data sources</p> <p>Understand what is meant by a sample and a population</p> <p>Understand how different sample sizes may affect the reliability of conclusions</p> <p>Identify possible sources of bias and plan to minimise it</p> <p>Understand how the timing and location of a survey can ensure a sample is representative</p>	<p>Construct and interpret cumulative frequency tables, graphs and diagrams</p> <p>Estimate frequency, the median, quartile values and interquartile range from a cumulative frequency diagram</p> <p>Compare the mean and range of two distributions, or median and interquartile range</p> <p>Interpret box plots to find median, quartiles, range and interquartile range</p>	<p>Produce box plots from raw data and when given quartiles, median and identify any outliers</p> <p>Construct and interpret histograms</p> <p>Use and understand frequency density</p> <p>Complete a grouped frequency table from a histogram</p> <p>Estimate the mean and median from a histogram</p>	<p>Sketch a graph of a quadratic function</p> <p>Find approximate solutions to quadratic equations using a graph</p> <p>Expand the product of more than two linear expressions</p> <p>Sketch a graph of a quadratic and linear function</p> <p>Sketch graphs of simple cubic functions, given as three linear expressions</p> <p>Solve simultaneous equations graphically and find their approximate solutions</p>	<p>Solve quadratic inequalities in one variable</p> <p>Represent the solution set for inequalities using set notation</p> <p>Solve linear inequalities in two variables graphically</p> <p>Show the solution set of several inequalities in two variables on a graph</p> <p>Use iteration with simple converging sequences</p>	<p>Identify and draw parts of a circle</p> <p>Prove and use the facts that: 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 alternate segment theorem opposite angles of a cyclic quadrilateral sum to 180°</p> <p>Understand and use the tangent at any point on a circle is perpendicular to the radius at that point</p> <p>Find and give reasons for missing angles on diagrams using: circle theorems; isosceles triangles; the angle between a tangent and radius is 90°; tangents from an external point are equal in length</p>	
Revision	Half paper 1A P1	Half paper 1A P2	Half paper 1A P3	Half paper 2A P1	Half paper 2A P2	Half paper 2A P3	



Week	8	9	10	11	12	13	14
Big ideas (key concepts)	Circle Geometry			Changing the subject, algebraic fractions, rationalising surds, proof		Vectors and geometric proof	
Lesson topics sequence	<p>Apply construction techniques and understanding of loci to draw graphs based on circles and perpendiculars of lines</p> <p>Find the equation of a tangent to a circle at a given point,</p> <p>Recognise and construct the graph of a circle using $x^2 + y^2 = r^2$ for radius r centred at the origin of coordinates</p>		Year 11 mock exams	<p>Rationalise the denominator involving surds</p> <p>Simplify algebraic fractions</p> <p>Multiply and divide algebraic fractions</p> <p>Solve quadratic equations arising from algebraic fraction</p> <p>Change the subject of a formula</p> <p>Solve 'Show that' and proof questions</p> <p>Use function notation</p> <p>Find $f(x) + g(x)$ and $f(x) - g(x)$, $2f(x)$, $f(3x)$ etc algebraically</p> <p>Find the inverse of a linear function</p> <p>Know that $f^{-1}(x)$ refers to the inverse function</p> <p>For two functions $f(x)$ and $g(x)$, find $gf(x)$</p>		<p>Understand and use vector notation</p> <p>Understand and interpret vectors as displacement in the plane with an associated direction</p> <p>Represent vectors, combinations of vectors and scalar multiples in the plane pictorially</p> <p>Calculate the sum of two vectors, the difference of two vectors and a scalar multiple of a vector using column vectors</p>	<p>Find the length of a vector using Pythagoras' Theorem</p> <p>Calculate the resultant of two vectors</p> <p>Solve geometric problems in 2D where vectors are divided in a given ratio</p> <p>Produce geometrical proofs to prove points are collinear and vectors/lines are parallel</p>
Key dates			Year 11 mock exams	Year 11 mock exams Year 11 data deadline		Year 11 results assembly	
Revision	Half paper 3A P1	Half paper 3A P2	Half paper 3A P3	Half paper 4A P1		Half paper 4A P2	June 2017 P1



Week	15	16	17	18	19	20
Big ideas (key concepts)	Reciprocals and exponential graphs, gradient and area under a curve	Direct and Inverse Proportion RECAP ONLY		Direct and Inverse Proportion RECAP ONLY		
Lesson topics sequence	<p>Recognise, sketch and interpret graphs of the reciprocal function</p> <p>Recognise, sketch and interpret graphs of exponential functions</p> <p>Use calculators to explore exponential growth and decay</p> <p>Set up, solve and interpret the answers in growth and decay problems</p> <p>Interpret and analyse transformations of graphs of functions and write the functions algebraically</p> <p>Estimate area under a curve</p> <p>Interpret and estimate the gradient of linear or non-linear graphs</p>	<p>Interpret the gradient of non-linear graph in curved distance–time and velocity–time graphs: Interpret the gradient of a linear or non-linear graph in financial contexts</p> <p>Interpret the area under a linear or non-linear graph in real-life contexts</p> <p>Interpret the rate of change of graphs of containers filling and emptying</p> <p>Interpret the rate of change of unit price in price graphs</p>		<p>Recognise and interpret graphs showing direct and inverse proportion Identify direct proportion from a table of values</p> <p>Write statements of proportionality for quantities proportional</p> <p>Set up and use equations to solve word and other problems involving direct proportion</p> <p>Use $y = kx$ to solve direct proportion problems</p> <p>Solve problems involving inverse proportion using graphs</p> <p>Solve problems involving inverse proportionality</p> <p>Set up and use equations to solve word and other problems involving direct proportion or inverse proportion</p>		Year 11 mock 2 exams
Key dates	Year 11 parents evening					Year 11 mock 2 exams
Revision	June 2017 P2	June 2017 P3		June 2018 P1		June 2018 P2



Week	21	22	23	24	25	26
Big ideas (key concepts)	Revision for mock exams	Probability		Further Trigonometry		Graphs of trigonometric functions
Lesson topics sequence	Year 11 mock 2 exams	<p>List all outcomes for single and combined events systematically Draw sample space diagrams and use them for adding simple probabilities Work out probabilities from Venn diagrams</p> <p>Use union and intersection notation</p> <p>Draw a probability tree diagram and use this to calculate the probability of independent, dependent combined events</p> <p>Use a two-way table to calculate conditional probability</p> <p>Use a Venn diagram to calculate conditional probability</p>		<p>Know and apply $\text{Area} = \frac{1}{2}ab\sin C$ to calculate the area, sides or angles of any triangle</p> <p>Use the sine and cosine rules to solve 2D problems</p> <p>Use the sine and cosine rules to solve 3D problems</p> <p>Use trigonometry and Pythagoras' Theorem in right-angled triangles, and use these to solve problems in 3D configurations</p> <p>Calculate the length of a diagonal of a cuboid</p> <p>Find the angle between a line and a plane</p>		<p>Recognise, sketch and interpret graphs of the trigonometric functions</p> <p>Know the exact values of $\sin \vartheta$ and $\cos \vartheta$ for $\vartheta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and 90° and $\tan \vartheta$ for $\vartheta = 0^\circ, 30^\circ, 45^\circ$ and 60° and find them from graphs</p> <p>Apply to the graph of $y = f(x)$ the transformations $y = -f(x)$, $y = f(-x)$, $y = f(x) + a$, $y = f(x - a)$ for sine, cosine and tan functions $f(x)$</p>
Key dates	Year 11 mock 2 exams	Year 11 data deadline	Year 11 progress reports			
Revision	June 2018 P3	Nov 2020 P1	Nov 2020 P2	Nov 2020 P3		



Week	27	28	29	30	31	32
Lesson topics sequence	Full papers used to inform planning in direct response to gaps in learning and question level analysis.					
Key dates			Year 11 exams start			