Sherborne International

Subject	Mathematics	Year	11	Key stage	4	Hours/week	3h 45m

Mathematics GCSE in 2 years (Year 2)

11

GCSE Maths 4th Edition FOUNDATION	9780008113827
GCSE Maths 4th Edition HIGHER	9780008113810

Week	Syllabus identifier	Detail: F H *[Black italics is additional and/or legacy from previous specification, but which cannot be assumed students have prior knowledge of. Detail in green is Higher Tier ONLY]*	Textbook F H	Key vocabulary
1 05/09/2016	**Algebra revision: A1-A7 (except A6)**	*Notation, vocabulary and manipulation* Use and interpret algebraic manipulation, including: ab in place of $a \times b$; $3y$ in place of $y + y + y$ and $3 \times y$; a^2 in place of $a \times a$ and a^3 in place of $a \times a \times a$, a^2b in place of $a \times a \times b$; $^a/_b$ in place of $a \div b$; coefficients written as fractions rather than as decimals, brackets; Substitute numerical values into formulae and expressions, including scientific formulae; Understand and use the concepts and vocabulary of expressions, equations, formulae, identities, inequalities, terms and factors; simplify and manipulate algebraic expressions (including those involving Surds **and algebraic fractions**) by: collecting like terms, multiplying a single term over a bracket, taking out common factors, expanding products of two **or more** binomials, factorising quadratic expressions of the form $x^2 + bx + c$, including the difference of two squares; **factorising quadratic expressions of the form $ax^2 + bx + c$;** simplifying expressions involving sums, products and powers, including the laws of indices; understand and use standard mathematical formulae; rearrange formulae to change the subject; where appropriate, interpret simple expressions as functions with inputs and outputs; **Interpret the reverse process as the 'inverse function'; interpret the succession of two functions as a 'composite function' (the use of formal function notation is expected)**		
2 12/09/2016	**Algebra: A6** *Notation, vocabulary and manipulation* **Algebra: A17** *Solving linear equations*	Know the difference between an equation and an identity; argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments **and proofs** Solve linear equations in one unknown algebraically (including those with the unknown on both sides of the equation); find approximate solutions using a graph;		
3 19/09/2016	**Algebra: A18** *Solving linear equations*	Solve quadratic equations (**including those that require rearrangement**) algebraically by factorising, **by completing the square and by using the quadratic formula**; find approximate solutions using a graph		
4 26/10/2016	**Algebra: A20, 21** *Solving linear equations*	Solve two simultaneous equations in two variables (linear/linear **or linear/quadratic**) algebraically; find approximate solutions using a graph; **find approximate solutions to equations numerically using iteration**		
5 03/10/2016	**Algebra: A22** *Solving linear inequalities*	Solve linear inequalities in one **or two** variable(s); **and quadratic inequalities in one variable;** represent the solution set on a number line; **using set notation and on a graph**		
6 10/10/2016	**Probability: P1, 2, 3, 4** *Application of basic probability*	Record, describe and analyse the frequency of outcomes of probability experiments using tables and frequency trees; apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments; relate relative expected frequencies to theoretical probability, using appropriate language and the 0-1 probability scale; apply the property		

		that the probabilities of an exhaustive set of outcomes sum to one; apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to one		
7 17/10/2016	**Probability: P5, 6, 7, 8** *Recording and calculating probability*	Understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size; enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams and tree diagrams; construct theoretical possibility spaces for single and combined experiments with equally likely outcomes and use these to calculate theoretical probabilities; calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions.		
24/10/2016	**Half Term holiday**			
8 31/10/2016	**Probability: P9** *Conditional probability*	**Calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams**		
9 07/11/2016	**Algebra: A23, 24, 25** *Sequences*	Generate terms of a sequence from either a term-to-term or a position-to-term rule; recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences, and simple geometric progressions (r^n where n is an integer, and r is a rational number > 0 **or a surd**) **and other sequences;** deduce expressions to calculate the nth term of linear **and quadratic** sequences		
10 14/11/2016	**Ratio, proportion and rates of change: R6, 7, 8** *Ratio* **Number: N9** *Standard form*	Express a multiplicative relationship between two quantities as a ratio or a Fraction; understand and use proportion as equality of ratios; relate ratios to fractions and to linear functions; calculate with and interpret standard form $A \times 10^n$, where $1 \le A < 10$ and n is an integer		
11 21/11/2016	**Ratio, proportion and rates of change: R10, 13, 14** *Direct and indirect proportion*	Solve problems involving direct and inverse proportion, including graphical and algebraic representations; understand that when X is inversely proportional to Y this is X is proportional to $^1/_Y$; **construct and** interpret equations that describe direct and inverse proportion; interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion		
12 28/11/2016	**Ratio, proportion and rates of change: R15, 16** *Rates of change*	Interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of average and instantaneous rate of change (gradients of chords and tangents) in numerical, algebraic and graphical contexts (this does not include calculus); set up, solve and interpret the answers in growth and decay problems, including compound interest **and work with general iterative processes**		
13 05/12/2016	**Number: N5** *Systematic listing strategies*	apply systematic listing strategies, **including use of the product rule for counting (i.e. if there are m ways of doing one task and for each of these, there are n ways of doing another task, then the total number of ways the two tasks can be done is $m \times n$ ways)**		
12/12/2016 19/12/2016 26/12/2016	**Christmas holiday**			
14 02/01/2017	**Revision for mock examinations**	*Individual revision programme/ revision of holiday work*		
15 09/01/2017	**Mock examinations**			
16 16/01/2017	**Geometry revision: G9, 17, 21** **Geometry: G22** *Advanced trigonometry*	Identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference, tangent, arc, sector and segment; know the formulae: circumference of a circle = $2\pi r = \pi d$, area of a circle = $\pi r2$; calculate: perimeters of 2D shapes, including circles; areas of circles and composite shapes*;* surface area and volume of spheres, pyramids, cones and composite solids; know the exact values of sin θ and cos θ for θ = 0°, 30°, 45°, 60° and 90°; know the exact value of tan θ for θ = 0°, 30°, 45° and 60°		

		Know and apply the sine rule *a sin A = b sin B = c sin C* , and cosine rule $a^2 = b^2 + c^2 - 2bc$ cos *A*, to find unknown lengths and angles;		
17 23/01/2017	**Geometry: G18, 23** *Advanced trigonometry*	Know and apply Area = ½ *ab* sin *C* to calculate the area, sides or angles of any triangle; Calculate arc lengths, angles and areas of sectors and segments of circles;		
18 30/01/2017	**Geometry revision: G5, 6** **Geometry: 5, 6, 12, 19** *Properties of solid objects* **Ratio: R12** *Similarity, ratios of length, area and volume*	Use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS); apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides, including Pythagoras' theorem and the fact that the base angles of an isosceles triangle are equal, and use known results to obtain simple proofs. Identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres; Apply the concepts of congruence and similarity, including the relationships between lengths, **areas and volumes** in similar figures; compare lengths, areas and volumes using ratio notation; make links to similarity (including trigonometric ratios) and scale factors		
19 06/02/2017	**Geometry: G10, 11** *Circle theorems and geometrical problems*	**Apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and use them to prove related results**; solve geometrical problems on coordinate axes		
13/02/2017	**Half term holiday**			
20 20/02/2017 **21** 27/02/2017	**Revise statistics: S1-6**	Infer properties of populations or distributions from a sample, while knowing the limitations of sampling; interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data, vertical line charts for ungrouped discrete numerical data, tables and line graphs for time series data and know their appropriate use; **construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals and cumulative frequency graphs, and know their appropriate use; i**nterpret, analyse and compare the distributions of data sets from univariate empirical distributions through: appropriate graphical representation involving discrete, continuous and grouped data, **including box plots;** appropriate measures of central tendency (median, mean, mode and modal class) and spread (range, including consideration of outliers, **quartiles and inter-quartile range**); apply statistics to describe a population; use and interpret scatter graphs of bivariate data; recognise correlation and know that it does not indicate causation; draw estimated lines of best fit; make predictions; interpolate and extrapolate apparent trends while knowing the dangers of so doing.		
22 06/03/2017	**Algebra: A12, 13** *Plotting and interpreting graphs.*	*Recognise, sketch and interpret graphs of exponential functions y = kˣ for positive values of k, and the trigonometric functions (with arguments in degrees) y = sin x, y = cos x and y = tan x for angles of any size;* sketch translations and reflections of a given function;		
23 13/03/2017	**Algebra: A15, 16** *Plotting and interpreting graphs.*	*Calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs), and interpret results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts (this does not include calculus);* 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		
24 20/03/2017 **25** 27/03/2017	**Geometry: G13** *Plans and elevations* **Geometry: G24, 25** *Vectors*	Construct and interpret plans and elevations of 3D shapes; describe translations as 2D vectors; apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors; **use vectors to construct geometric arguments and proofs**		
03/04/2017 10/04/2017	**Holy Week/ Easter holiday**			
26 17/04/2017				

27 24/04/2017			
28 01/05/2017			
29 08/05/2017			
30 15/05/2017			
31 23/05/2017			
29/05/2017	**Half term holiday**		
	Examinations **Paper 1: Thursday 25 May 2017** **Paper 2: Thursday 08 June 2017** **Paper 3: Tuesday 13 June 2017**		