Autumn Term

Algebra: further quadratics, rearranging formulae and identities 04/09/2019

	Specification content	Specification notes
A4 (40)	Simplify and manipulate algebraic expressions (including those involving surds) by: 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** $x^2 + bx + c$ simplifying expressions involving sums, products and powers, including the laws of indices	
A5 (45)	Understand and use standard mathematical formulae Rearrange formulae to change the subject	including use of formulae from other subjects in words and using symbols
A6 (46)	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**	
A7 (48)	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'**	understand and use function notation: $f(x)$, $fg(x)$ and $f^{-1}(x)$ s expected at higher tier

Trigonometry recap and extension 23/09/2019

	Specification content	Specification notes
G20 (152)	Know the formula for Pythagoras' Theorem $a^2+b^2=c^2$ Apply it to find length in right angled triangles **and, where possible, general triangles** in two **and three** dimensional figures Know and use the trigonometric ratios $\sin\theta = \frac{opposite}{hypotenuse}$, $\cos\theta = \frac{adjacent}{hypotenuse}$ and $\tan\theta = \frac{opposite}{adjacent}$ Apply them to find angles and lengths in right-angled triangles **and, where possible, general triangles** in two **and three** dimensional figures	
G21 (156)	Know the exact values of $\sin\theta$ and $\cos\theta$ for $\theta =$ 0°, 30° 45°, 60° and 90° Know the exact value of $\tan\theta$ for $\theta =$ 0°, 30°, 45° and 60°	
G6 (125)	Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides including Pythagoras' Theorem, use known results to obtain simple proofs	
R12 (104)	Compare lengths using ratio notation; Make links to trigonometric ratios	

Growth and decay 14/10/2019

	Specification content	Specification notes
R16 (112)	Set up, solve and interpret the answers in growth and decay problems, including compound interest **and work with general iterative processes**	

Equation of a circle 28/10/2019

	Specification content	Specification notes
A16 (69)	**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.**	

Further equations and graphs 04/11/2019

	Specification content	Specification notes
A17 (71)	Solve linear equations in one unknown algebraically including those with the unknown on both sides of the equation Find approximate solutions using a graph	including use of brackets
A18 (72)	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	INCLUDE NON-LINEAR SIMULTANEOUS EQNs for top set.
A12 (57)	Recognise, sketch and interpret graphs of linear and quadratic functions	

A11 (55)	Identify and interpret roots, intercepts and turning points of quadratic functions graphically; deduce roots algebraically **and turning points by completing the square**	including the symmetrical property of a quadratic
A21 (79)	Translate simple situations or procedures into algebraic expressions or formulae derive an equation, solve the equation and interpret the solution	including solution of geometrical problems and problems set in context

Direct and inverse proportion 18/11/2019

	Specification content	**Specification notes**
R10 (101)	Solve problems involving direct and inverse proportion, including graphical and algebraic representations	
R13 (106)	Understand that x is inversely proportional to y is equivalent to x is proportional to 1/y **Construct and** interpret equations that describe direct and inverse proportion	
R14 (108)	Recognise and interpret graphs that illustrate direct and inverse proportion	

Spring Term

Inequalities 06/01/2020

	Specification content	Specification notes
A22 (81-3)	Solve linear inequalities in one **or two** variables **and quadratic inequalities in one variable** Represent the solution set on a number line, **using set notation and on a graph**	know the conventions of an open circle on a number line for a strict inequality and a closed circle for an included boundary in graphical work the convention of a dashed line for strict inequalities and a solid line for an included inequality will be required

Vectors 13/01/2020

	Specification content	Specification notes
G25 (161)	Apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representation of vectors **Use vectors to construct geometric arguments and proofs**	

Further sketching graphs 20/01/2020

	Specification content	Specification notes
A12 (57)	Recognise, sketch and interpret graphs of linear functions, quadratic functions, simple cubic functions and the reciprocal function $y = \frac{1}{x}$ with $x \neq 0$, **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**	

Sine and cosine rules 27/01/2020

	Specification content	Specification notes
G22 (158)	**Know and apply the Sine rule** $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ **and Cosine rule** $a^2 = b^2 + c^2 - 2bc\cos A$ **to find unknown lengths and angles**	
G23 (159)	**Know and apply** $= \frac{1}{2}abs\sin C$ **to calculate the area, sides or angles of any triangle**	

Transforming functions 24/02/2020

	Specification content	Specification notes
A13 (59)	**Sketch translations and reflections of a given function**	

Numerical methods 02/03/2020

	Specification content	Specification notes
A20 (78)	**Find approximate solutions to equations numerically using iteration**	including the use of suffix notation in recursive formulae

Circle theorems 09/03/2020

	Specification content	Specification notes
G10 (133)	**Apply and prove the standard circle theorems concerning angles, radii, tangents and chords and use them to prove related results**	including angle at centre is equal to twice angle at circumference; angle in a semi-circle is 90°; angles in the same segment are equal; opposite angles in a cyclic quadrilateral sum to 180°; tangent at any point on a circle is perpendicular to the radius at that point tangents from an external point are equal in length; the perpendicular from the centre to a chord bisects the chord;

		alternate segment theorem

Summer Term

Gradients and rate of change 15/04/2020

	Specification content	Specification notes
R15 (109)	**Interpret the gradient at a point on a curve as the instantaneous rate of change** **Apply the concepts of average and instantaneous rates of change (gradients of chords and tangents) in numerical, algebraic and graphical contexts**	
R14 (108)	Interpret the gradient of a straight-line graph as a rate of change	

Pre-calculus and area under a curve 27/04/2020

	Specification content	Specification notes
A15 (63)	**Calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs)** **Interpret the results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts**	

Algebraic fractions 11/05/2020

	Specification content	Specification notes
A4 (40)	**Simplify and manipulate algebraic expressions involving algebraic fractions**	

Year 11 Higher SOW