

# Year 11

**Module 1: Graphs and real life problems**

**Module 2: Vectors**

**Module 3: Functions**

**Module 4: Trigonometric functions**

**Module 5: Area and circumference of circles**

**Module 6: Surface area and volume**

**Module 7: Indices and algebraic functions**

**Module 8: Proportionality**

**Module 9: Sine and cosine rule**

**Module 10: Simultaneous equations**

**Module 11: Algebraic proof**

<b>Autumn Term Year 11</b>		<b>Topic: Graphs and Real Life Problems Module: 1 Recommended Time: 7 Hours</b>	<b>Resources /Work related/ A level extension</b>
	NA6d	<ul style="list-style-type: none"> <li>Constructing linear functions and plotting the corresponding graphs from real-life problems</li> </ul>	
	NA6d	<ul style="list-style-type: none"> <li>Discussing and interpreting graphs modelling real situations</li> </ul>	Oxford pg 311 tax calculations
		<ul style="list-style-type: none"> <li>Understanding and using compound measures, speed and density</li> </ul>	10√ L7/8-6 pg29 10√ L9/10-5 pg 31-32 Faster and Faster Internet Challenge Working holiday activity Oxford pg 506
		<b>Topic: Vectors Module: 2 Recommended Time: 7 Hours</b>	<b>Resources /Work related/ A level extension</b>
	SMM3f	<ul style="list-style-type: none"> <li>Understanding and using vector notation</li> </ul>	(i , j) notation Complex Numbers
<b>Autumn Term Year 11</b>	SSM3f	<ul style="list-style-type: none"> <li>Calculating, and representing graphically the sum of two vectors, the difference of two vectors and a scalar multiple of a vector</li> </ul>	<b>3D Vectors</b>
	SMM3f	<ul style="list-style-type: none"> <li>Calculating the resultant of two vectors</li> </ul>	Planetary motion
	SSM3f	<ul style="list-style-type: none"> <li>Solving simple geometric problems in 2-D using vector methods</li> </ul>	
		<b>Topic: Functions Module:3 Recommended Time: 4 Hours</b>	<b>Resources /Work related/ A level extension</b>
		<ul style="list-style-type: none"> <li>Drawing graphs and recognising shapes of these functions</li> </ul>	10√ L7/8-3 pg37-38
	NA6e	<ul style="list-style-type: none"> <li>Quadratic</li> </ul>	Conic sections Internet Challenge
NA6f	<ul style="list-style-type: none"> <li>Cubic</li> </ul>	Activity Sheet NA16	
NA6f	<ul style="list-style-type: none"> <li>Reciprocal</li> </ul>	Famous Curves Internet Challenge	
	<ul style="list-style-type: none"> <li>Equation of a circle centre the origin</li> </ul>	<b>Equation of a circle centre other than (0,0)</b> Working with ellipse in engineering	

	<b>Topic:Functions    Module: 4    Recommended Time: 7 Hours</b>	<b>Resources /Work related/ A level extension</b>
NA6g	<ul style="list-style-type: none"> <li>Applying to the graph of <math>y = f(x)</math> the transformations <math>y = f(x) + a</math>, <math>y = f(ax)</math>, <math>y = f(x+a)</math>, <math>y = af(x)</math> and combined transformations</li> </ul>	Activity Sheet NA13 Key Maths ICT H pg 515 <b>Modulus function <math>y= x </math></b>
SMM2g	<ul style="list-style-type: none"> <li>Drawing, sketching and describing the graphs of trigonometric functions for angles of any size, including transformations involving scalings in either or both the x and y directions</li> </ul>	Maths Agony 11Mar 05 10√ L9/10-2 pg 19-29 Activity Sheet SSM21 Activity Sheet NA19 Activity Sheet NA18 Sound curve, root mean square current

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	<b>Topic: Area and circumference of circles      Module: 5</b> <b>Recommended Time: 7 Hours</b>	<b>Resources /Work related/ A level extension</b>
SSM2g	<ul style="list-style-type: none"> <li>Understand similarity of triangles and other plane figures</li> </ul>	10√ L9/10-3 pg9, 13-14 Key Maths H pg 197 Key Maths H pg199
SSM4d	<ul style="list-style-type: none"> <li>Finding circumferences of circles and areas enclosed by circles</li> </ul>	Measuring the Earth Internet Challenge
SSM4d	<ul style="list-style-type: none"> <li>Calculating the lengths of arcs and sectors of circles</li> </ul>	<b>Measuring angles in radians</b>
SSM4d	<ul style="list-style-type: none"> <li>Convert between area measures, including square centimetres and square metres, and volume measures including cubic centimetres and cubic metres</li> </ul>	
NA3n	<ul style="list-style-type: none"> <li>Using surds and pi in exact calculations, without a calculator</li> </ul>	
	<b>Topic: Surface Area and volume      Module: 6</b> <b>Recommended Time: 11 Hours</b>	<b>Resources /Work related/ A level extension</b>
SSM4d	<ul style="list-style-type: none"> <li>Finding the surface area of simple shapes made by using the formulae for the areas of triangles, rectangles and circles</li> </ul>	Activity Sheet SSM20 Heron's formula Internet Challenge
SSM2i	<ul style="list-style-type: none"> <li>Draw and interpret plans and elevations</li> </ul>	10√ L6-2 pg 40-41
SSM4b	<ul style="list-style-type: none"> <li>Draw nets and solids and recognise solids from nets</li> </ul>	
SSM3b	<ul style="list-style-type: none"> <li>Draw planes of symmetry in 3-D shapes</li> </ul>	
SSM2i	<ul style="list-style-type: none"> <li>Solving problems involving surface areas and volumes of               <ul style="list-style-type: none"> <li>Prisms</li> <li>Cylinders</li> <li>Cones</li> <li>Pyramids</li> <li>Spheres</li> </ul> </li> </ul>	Key Maths H pg329 Water recycling Oxford pg 80-81 Packaging problems
SSM2g	<ul style="list-style-type: none"> <li>Understanding the relationship between areas and volumes of similar shapes</li> </ul>	

	SSM4d	<ul style="list-style-type: none"> <li>Convert between volume measures, including cubic centimetres and cubic metres</li> </ul>	
	NA3n	<ul style="list-style-type: none"> <li>Using surds and pi in exact calculation, without a calculator</li> </ul>	
	SSM3d	<ul style="list-style-type: none"> <li>Understanding the difference between formulae for perimeter, area and volume by considering dimensions</li> </ul>	
		<b>Mock Exam</b>	
<b>Spring Term, Year 11</b>		<b>Topic: Indices, algebraic functions and exponential functions    Module: 7 Recommended Time: 7 Hours</b>	<b>Resources /Work related/ A level extension</b>
	NA2b	<ul style="list-style-type: none"> <li>Using index notation and index laws for multiplication and division of integers</li> </ul>	
	NA3g	<ul style="list-style-type: none"> <li>Using the fact that <math>n^0 = 1</math> and <math>n^{-1} = 1/n</math> for positive integers <math>n</math>, the corresponding rule for negative integers, <math>n^{1/2} = \text{square root } n</math> and other fractional powers as well as negative fractional powers</li> </ul>	Expanding brackets with a selection of powers
		<ul style="list-style-type: none"> <li>Find the values of <math>p</math> and <math>q</math> in the function <math>y = pq^x</math> given the graph of <math>y = pq^x</math></li> </ul>	Half life radioactivity
		<b>Topic: Proportionality    Module: 8 Recommended Time: 4 Hours</b>	<b>Resources /Work related/ A level extension</b>
	NA5h	<ul style="list-style-type: none"> <li>Setting up and using equations to solve word problems involving direct proportion or inverse proportion and relating algebraic solutions to graphical representations of the equations</li> </ul>	Wind power :variation activity Oxford pg 528
<b>Spring Term.</b>	NA3l	<ul style="list-style-type: none"> <li>Calculating an unknown quantity from quantities that vary in direct or inverse proportion</li> </ul>	
		<b>Topic: Sine and cosine rule    Module: 9 Recommended Time: 11 Hours</b>	<b>Resources /Work related/ A level extension</b>
	SMM2g	<ul style="list-style-type: none"> <li>Drawing, sketching and describing the graphs of trigonometric functions</li> </ul>	Link to the unit circle

SSM2g	<ul style="list-style-type: none"> <li>Using the sine and cosine rules to solve 2-D problems</li> </ul>	Navigational, orienteering
SSM2g	<ul style="list-style-type: none"> <li>Calculating the area of a triangle using <math>\frac{1}{2} ab \sin C</math></li> </ul>	
SSM2g	<ul style="list-style-type: none"> <li>Using the sine and cosine rules to solve 3-D problems</li> </ul>	
	<b>Topic: Simultaneous equations    Module: 10</b> <b>Recommended Time: 7 Hours</b>	<b>Resources /Work related/ A level extension</b>
NA6e	<ul style="list-style-type: none"> <li>Finding the intersecting points of the graphs of linear and quadratic function</li> </ul>	
NA6h	<ul style="list-style-type: none"> <li>Constructing the graph of <math>x^2 + y^2 = r^2</math> for a circle of radius <math>r</math> centred at the origin</li> </ul>	
NA6l	<ul style="list-style-type: none"> <li>Finding graphically the intersection points of a given straight line and a circle</li> </ul>	
NA5l	<ul style="list-style-type: none"> <li>Solving exactly, by elimination of an unknown, two simultaneous equations in two unknowns, one of which is linear in each unknown, and the other is linear in one unknown and quadratic in the other, or where the second is in the form <math>x^2 + y^2 = r^2</math></li> </ul>	Solving 3 variables in 3 simultaneous equations
NA5i	<ul style="list-style-type: none"> <li>Solving equations by the method of intersecting graphs</li> </ul>	Number of solutions for horizontal $y=c$ and intersection with a cubic
	<b>Topic: Algebraic Proof    Module: 11    Recommended</b> <b>Time: 4 Hours</b>	<b>Resources /Work related/ A level extension</b>
NA1k	<ul style="list-style-type: none"> <li>Understand the difference between a proof and a demonstration</li> </ul>	
NA1k	<ul style="list-style-type: none"> <li>Give a rigorous and logical algebraic proof</li> </ul>	
	<b>REVISION</b>	
	<ul style="list-style-type: none"> <li>Non Calculator Topic Exam Bank</li> <li>GCSE Topic Exam Bank</li> </ul>	



○ Past Papers

