Maths Long Term Plan Year 11 Higher

Chichester Free School
Nurture • Challenge • Inspire

Temperance Term

W/C	1	2	3	4	5	6	7	8	
Area of Study	**Ratio and Proportion**			**Algebra 3**					
Core learning	Ratio To use ratio notation to write ratios for diagrams and word statements and to simplify ratios. To divide a quantity into two or more parts given a specificed ratio and to write the division of quantities into parts as a ratio. To use a unitary method to solve ratio and proportion problems and relate ratios to fractions and linear functions in order to solve problems.	Proportion To use direct proportion to solve problems. To use the unitary method to solve proportion problems. To solve direct proportion questions graphically. To solve direct proportion questions using algebraic manipulation. To solve direct proportion problems involving the square or square root of a variable. To solve inverse proportion questions, based on y = 1/x.	Growth and decay To calculate with simple growth, such as simple interest rates. To calculate with compound growth, such as compound interest rates. To solve word problems using compound interest. To use the formula for compound growth. To calculate with simple and compound decay, such as depreciation. To solve word problems using compound decay. To use the formula for compound decay.	Graphs of linear functions To use a table of values to plot graphs of linear functions. To identify the main features of straight-line graphs and use them to sketch graphs. To sketch graphs from linear equations in the form of y=mx + c. To find the equation of a straight-line using gradient and points on the line. To find the equation of a tangent hat touches a circle centred on the origin. To solve problems involving straight-line graphs.	Interpreting graphs To construct and interpret graphs in real-world contexts. To interpret the gradient of a straight-line graph as a rate of change.	Graphs of other functions/equations To work fluently with equations of straight-line graphs. To identify and plot graphs of quadratic functions. To find roots of quadratic equations from the x-intercept of the parabola. To know the features of graphs of quadratic equations. To sketch parabolas. To work fluently with cubic polynomials and their graphs. To sketch cubic graphs. To work fluently to calculate reciprocals of numbers and plot functions involving reciprocals. To identify hyperbolas and match them to their equations. To plot and sketch graphs from given functions.		HALF TERM
Opportunities for Challenge: Open middle, goal free, exam questions, “by example”, SSDD are good resources but always choose problems based on the current topic.									
Assessment			Progress Check			Progress Check			

W/C	9	10	11	12	13	14	
Area of study	**Algebra 3**		**Circles**		**Mocks**		
Core learning	Transformations of curves To know the features of a quadratic function: axis of symmetry, roots and vertex, and identify these features from the sketch of a quadratic. To sketch vertical and/or horizontal translations of quadratic functions. To know the effect of translations on the axis of symmetry and vertex of a quadratic. To use graph sketching to identify the effect of multiplying f(x) by -1. To use algebraic manipulation skills to identify the features above and sketch any quadratic. To identify reflections and translations in the graphical representations of trigonometric functions. To sketch a transformed trigonometric curve for a given domain. To sketch translations and reflections of cubic, reciprocal, and exponential functions. To apply transformations learnt in order to solve problems.		Circles To review the names of parts of a circle. To label angles correctly and refer to angles in a diagram involving a circle. To use and prove the following circle theorems: Angles subtended at the centre and at the circumference Angles in a semicircle Angles in the same segment Angle between a radius and a chord Angle between a radius and a tangent Two tangent theorem Alternate segment theorem Angles in a cyclic quadrilateral		Revision		CHRISTMAS
Opportunity for Challenge: Open middle, goal free, exam questions, “by example”, SSDD are good resources but always choose problems based on the current topic.							
Assessment			Progress Check			Formal, summative	

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Justice Term

W/C	15	16	17	18	19	20	
Area of study	**Geometry 3**						HALF TERM
Core learning	Vector geometry Represent vectors as a diagram or a column vector. Add and subtract vectors. Multiply vectors by scalars. Recognise parallel vectors. Use vectors to construct geometric arguments and proofs.	Transformations Carry out identify and describe reflections, rotations, translations and enlargements. Find the centre of rotation or enlargement by construction. Carry out identify and describe combined transformations.	Construction and loci Use a ruler, protractor and a pair of compasses to accurately construct angles and shapes. Accurately copy a diagram using ruler and compasses. Construct a perpendicular bisector of a line. Construct the perpendicular at a given point on a line. Construct a perpendicular from a given poitn to a line. Bisect an angle. Use constructions to solve loci problems. Solve problems in context using constructions and loci.	Similarity Know what is meant by "mathematically similar". Determine if two objects are similar. Know what is meant by "mathematical enlargement". Know what the centre of enlargement is. Enlarge a shape given a scale factor and the centre of enlargement. Determine a given centre of enlargement and scale factor from a diagram. Enlarge a shape given a negative rational scale factor. Determine similar polygons. Determine similar 3D shapes. Know the relationship between length, area and volume of similar shapes.	Congruence Know what is means to be congruent. Know the conditions for congruence in triangles. SSS, ASA, SAS, RHS. Apply the conditions for congruency to a variey of situations.	
Opportunity for Challenge: Open middle, goal free, exam questions, "by example", SSDD are good resources but always choose problems based on the current topic.							
Assessment			Progress check			Progress check	

W/C	21	22	23	24	25	26	
Area of study	**Mocks**	**Geometry 4**					EASTER
Core learning		Pythagoras' Theorem Know and use the theorem to find missing lengths of RA triangles. Use the theorem to show whether a triangle is RA or not. Apply the theorem to 2D problems. Apply the theorem to 3D problems. Link the theorem to real-life skills for industry.		Trigonometry Use the trig ratios given by sine, cosine and tangent functions to find unknown lengths and angles in RA triangles. Know the exact ratios given by sine, cosine of 0, 30, 45, 60 and 90 degrees and the exact ratios given by tangent for 0, 30, 45, 60. Use the sine rule, the cosine rule and the sine area rule to solve problems with non-RA triangles. Know the difference between an angle of elevation and an angle of depression. Identify when trig must be used instead of pythagoras' theorem.		
Opportunity for Challenge: Open middle, goal free, exam questions, "by example", SSDD are good resources but always choose problems based on the current topic.							
Assessment					**Progress check**		

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Courage Term

W/C	27	28	29	30	31		HALF TERM
Area of study	Revision		Revision				
Core learning							
Opportunity for Challenge: Open middle, goal free, exam questions, “by example”, SSDD are good resources but always choose problems based on the current topic.							
Assessment							
W/C	32	33	34	35	36	37	SUMMER
Area of study	Exams						
Core learning							
Opportunity for Challenge: Open middle, goal free, exam questions, “by example”, SSDD are good resources but always choose problems based on the current topic.							
Assessment							