Year 11 GCSE Revision -		
Week	Topics for	Re-visit work
beginning	revision	
6 th February	Expressions,	Derive formulae
rebruary	Formulae	Substitute numbers (positive or negative) into a formula, including formulae with x^2 or x^3 terms
		Change the subject of a simple formula
		Change the subject of a formula where the subject appears on both sides of the formula
		Change the subject of a formula that includes a power of the subject
		☐ Simplify by collecting like terms
		Multiply out a single bracket
		Factorise a single bracket by taking out a common factor
		Expand two brackets
		Factorise quadratics into two brackets
		Factorise quadratics using the difference of two squares, eg.4y ² - 25=(2y+5)(2y-5)
		Simplify algebraic expressions by cancelling, adding, subtracting and multiplying
		Set up simple equations for a problem
		Rearrange simple equations
		Solve simple equations
		Solve equations with the unknown on either side
		Solve equations with the unknown on both sides
		Solve equations that include brackets
		Solve equations with negatives, including negative answers
		Solve equations involving fractions
	Interior and	Calculate the sum of interior angles in a polygon
	exterior angles of polygons	Understand the polygon names; hexagon, heptagon, octagon and decagon
		Use the angle sum of an irregular polygon in a problem
		Calculate and use the sum of the interior angles of a regular polygon
		Understand and use fact that the exterior angles of a polygon add up to 360°
		Understand and use the fact that the interior and exterior angles at one vertex of a polygon add up to 180°
		Be able to calculate the exterior angle of a regular polygon
		Be able to calculate the interior angle of a regular polygon
		Be able to deduce the number of sides of a regular polygon, given one of its angles
		Understand tessellations of regular and irregular polygons

		Tessellate combinations of polygons
		Explain why some shapes tessellate and some do not
13 th February	Circle Theorems	Prove and use each of the circle theorems:
losidary		Tangent is perpendicular to the radius at the point the tangent meets the circle
		Two tangents from a point are equal in length
		Angle subtended from an arc at the centre is twice the angle at the circumference
		Angle in a semicircle is a right angle
		Angles in the same segment are equal
		Opposite angles of a cyclic quadrilateral add up to 180°
		Alternate segment theorem
		Perpendicular from the centre to a chord bisects the chord
		Calculate the following
	Types of average	
	and range	☐ Mode
		Modal class
		│ □ Median
		☐
		□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
		Estimate the mean of grouped data using mid-points of intervals
		Find median, quartiles and interquartile range for grouped data
		Estimate the mean for grouped data
		Find median, quartiles and interquartile range from a cumulative frequency graph
		☐ Find median, quartiles and interquartile range from a box plot
20 th February	Index Laws	\Box Know all the square numbers from $2^2 = 4$ up to $15^2 = 225$
HALF		\square Know all the cube numbers from $2^3 = 8$ up to $5^3 = 125$ and also $10^3 = 1000$
IERM		\Box Use index notation for squares and cubes, eg. 5 ³
		\Box Use index notation for powers of 10, eg. 10 ⁶
		Understand indices in calculations
		Multiply and divide by adding or subtracting indices
		Calculate using index laws when indices are fractions or negative
		\Box Understand that for any number n, n ^o = 1
		\Box Understand that n ⁻¹ = 1 / n
		\Box Understand that $n^{1/2} = \sqrt{n}$
		Understand that $n^{1/3} = {}^{3}\sqrt{n}$

	Standard Form	Understand numbers written in standard form
		Write large or small numbers in standard form
		Convert between standard form and normal form
		Understand and use standard form on a calculator
	Converting	☐ Know conversion factors between different metric units
	measurements	Convert between metric units
		Convert between imperial units, given the conversion factor
		Know rough imperial/metric equivalents as follows
		\Box 1 kg = 2.2 pounds
		\Box 1 litre = 1 ³ / ₄ pints
		\Box 4.5 litres = 1 gallon
		\square 8 km = 5 miles
		\square 30 cm = 1 foot
		Convert between imperial and metric measures using the above conversion factors
		Convert between metric measurements of area
		Convert between metric measurements of volume
		Convert between different metric units of speed, eg. metres per second and km per hour
		Convert between metric units of volume and metric units of capacity, eg. $1 \text{ cm}^3 = 1 \text{ ml}$
	Compound measures	Understand and use compound measures, including speed and density
27th	Fractions,	Find equivalent fractions
February	Percentages	☐ Simplify a fraction to its simplest form
		Convert between improper fractions and mixed numbers
		Add and subtract fractions
		☐ Know fraction to decimal conversions for simple fractions
		Convert between fractions and decimals
		 Understand that all recurring decimals are exact fractions, and that some exact fractions are recurring decimals
		Convert between recurring decimals and fractions
		Know how to convert from recurring decimal to fraction using a proof
		Understand percentages
		Convert between fractions, decimals and percentages
		Find a fraction of a quantity
		Find a percentage of a quantity
		Use decimals to find quantities

		Use a multiplier to increase of decrease a quantity (eg. use x 1.05 to increase by 5%, or 0.88 to decrease by 12%))
		Use percentages to calculate and use
		◦ VAT
		 Simple interest
		o Income tax
		 Compound interest
		• Depreciation
		 Prices after an increase or decrease
		 Percentage profit and loss
		Find the original amount, given the new amount and the percentage change
		Calculate repeated proportional change
		Use a multiplier raised to a power to calculate repeated proportional change
		Use a multiplier to increase or decrease by a percentage
		☐ Find one number as a fraction of another number
		Find one number as a percentage of another number
		Multiply using percentages as operators
6 th March	Pythagoras'	Understand and use Pythagoras' theorem in triangles
		Understand and use Pythagoras' theorem in 3D problems
		Understand the language associated with 3D shapes, including diagonals of a cuboid
		Use Pythagoras' theorem to calculate the length of a diagonal of a cuboid
	Trigonometry	Understand and remember trigonometric relationships in right angled triangles
		Use trigonometry in 2D problems
		Use trigonometry in 3D problems
		Use trigonometry to find the angle between a line and a plane
		Find angle of elevation and angle of depression
		Use the sine rule to solve 2D and 3D problems
		Use the cosine rule to solve 2D and 3D problems
		\Box Calculate the area of a triangle using the formulae A = $\frac{1}{2}$ ab sinC
	Surds	Use surds (roots) calculations without a calculator, leaving the surd in
		\square Give an answer to a Pythagoras question as $\sqrt{17}$
		$\square \text{ Manipulate surds in calculations eq. (3 - \sqrt{3})2$
		 Rationalise a denominator, ie. manipulate so that there is no longer a surd on the bottom of the fraction

13 th March	Ratio	Write a ratio in its simplest form
		Divide a quantity in a given ratio
		Solve problems using ratios
	Direct and	Calculate an unknown quantity where quantities are in direct proportion
	proportion	Calculate an unknown quantity where quantities are in inverse proportion
		Set up equations to solve word problems involving direct proportion
		Set up equations to solve word problems involving indirect proportion
		Understand and use graphs of equations involving direct and indirect
		proportion
	Angles on	☐ Angles round a point add up to 360°
	intersecting lines,	Angles on a straight line add up to 180°
	in triangles and	Perpendicular lines
	and on parallel lines	Know the properties of scalene, isosceles, equilateral and right-angled triangles
		☐ Angles in a triangle add up to 180°
		Angle properties of intersecting lines, and vertically opposite angles are equal
		Be able to mark parallel lines on a diagram
		Corresponding angles in parallel lines
		Alternate angles in parallel lines
		Calculate angles and give reasons
		Explain why the angle sum of a quadrilateral is 360°
		Understand a proof that the angle sum of a triangle is 180°
		Understand the proof that the exterior angle of a triangle of a triangle is equal to the sum of the interior angles at the other two vertices
		Calculate angles in more complex problems
20 th March	Granhs	
	Graphs	\Box Understand that an equation of the form $y = my + c$ corresponds to a
		straight line graph
		Plot straight line graphs from their equations
		\Box Plot and draw a graph of an equation in the form y = mx + c
		Find the gradient of a straight line graph
		Find the gradient of a straight line graph from its equation
		Understand that a graph of an equation in the form
		y = mx + c has gradient of m and a y intercept of c (ie. crosses the y axis at c)
	Gradients of parallel and	Understand how the gradient of a real life graph relates to the relationship between the two variables
	perpendicular lines	Understand how the gradients of parallel lines are related
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		Understand how the gradients of perpendicular lines are related
		\Box Understand that if the gradient of a graph in the form y = mx + c is m,
		then the gradient of a line perpendicular to it will be $-rac{1}{m}$
		Generate equations of a line parallel or perpendicular to a straight line graph
		Show the solution to several inequalities with two variables on a graph
	Simultaneous equations (one	Find the intersection of a linear and a quadratic graph to find (approximate) solutions to simultaneous equations
	quadratic)	Solve simultaneous equations (one linear, one quadratic in one variable) by elimination
		Solve simultaneous equations where one equation is of the form $x^2 + y^2 = r^2$
	Other graphs	Plot, sketch or recognise graphs of cubic functions
		\Box Plot, sketch or recognise graphs of y = 1/x
		\Box Plot, sketch or recognise graphs of y = k ^x for integer values of x
		Plot, sketch or recognise graphs of $y = \sin x$ and $y = \cos x$ from -360° to +360°
	Graphs of loci	Draw or plot other mathematical functions
		Recognise or analyse other mathematical functions
		\Box Construct the graphs of simple loci including the circle, $x^2 + y^2 = r^2$
		☐ Find the points of intersection of a circle and a straight line
	Graphs from quadratic and	Apply understanding of loci to construct graphs based on circles and perpendicular lines
	other functions	Generate points for quadratic functions
		Plot graphs of quadratic functions
		Find (approximate) solutions to a quadratic equation from the graph of its function
		Find (approximate) solutions to simultaneous equations, one quadratic and one linear from the intersections of their graphs
27 th March	Straight edge and	Construct a given triangle
	constructions	Construct an equilateral triangle
		Understand that SSS, SAS, ASA and RHS triangles are unique but ASS ones are not
		Construct a perpendicular bisector of a line
		Construct a perpendicular from a point to a line
		Construct a perpendicular from a point on a line
		Bisect an angle
		Construct angles of 60°, 90°, 30° and 45°
		Construct parallel lines
		Draw circles and arcs of a given radius
		Construct a regular hexagon inside a circle

		Construct diagrams involving any of the above
		Construct diagrams from given information
	Deprings	Use 3 figure bearings to specify direction
	Bearings	Mark a point on a diagram, given a bearing and distance from another point
		Measure or draw a bearing on a map or scale plan
		Given a bearing of one point from another, find the bearing of the first
		point from the second
	Solve quadratic	Solve quadratic equations by factorisation
	equations	Solve quadratic equations by completing the square
		Solve quadratic equations using the quadratic formula
3 rd April	Charts and	Draw the following charts or diagrams
	diagrams	Bar chart
		Dual bar chart
		Pie chart
		Histogram with equal class intervals
		Frequency polygon
		Frequency diagram for grouped discrete data
		Scatter graph
		Line graph
		Frequency polygon for grouped data
		Grouped frequency table for continuous data
		Stem and leaf diagram
		Two-sided stem and leaf diagram
		Cumulative frequency table
		Cumulative frequency graph
		Box plots (from raw data, or when given the median and quartiles)
		Histograms with unequal class intervals, using frequency density
	Interpreting	Understand and find information from
	graphs and	pie charts
	diagrams	stem and leaf diagrams
		scatter graphs
		frequency polygons
		□ box plots
		cumulative frequency diagrams
		🗌 histograms

		Find the median or other information from a histogram, for example the number of people in a particular group
		Find information from line graphs, frequency polygons and frequency diagrams
		Find information from pie charts
		Find median, mode, range and interquartile range from stem and leaf diagrams
		Estimate values and find median, quartiles and interquartile range from a cumulative frequency graph
		Complete a frequency table from a histogram
		Understand and define frequency density
		Draw a line of best fit
		Understand positve, negative and no correlation
		Understand that correlation does not always imply one thing causes the other
		Predict values using a line of best fit
		Understand that "no correlation" does not necessarily mean no relationship between the values, just no linear relationship
10th April	Probability	Impossible, unlikely, even chance, likely and certain events
EASTER		Mark events or probabilities on a 0 to 1 probability scale
		Write probabilities as fractions, decimals or percentages
		Find probabilities of events using dice, spinners, coins
		Understand and use relative frequency as estimates of probability
		Calculate an estimate of how many times an event will occur, given its probability and the number of trials
		List the outcomes for one or two events
		Use and draw diagrams to show all possibilities
		\Box Understand that the sum of all the mutually exclusive outcomes is 1
		Know that if P is a probability of an outcome occurring, then 1 - P is the probability of the same outcome not occurring
		Fill in a missing probability in a table
		$\square Know and use the fact that, for mutually exclusive events, P(A OR B) = P(A) + P(B)$
		\Box Know that, for independent events, P(A AND B) = P(A) x P(B)
		Understand the difference in calculation for selection of an object with or without replacement
		Draw a probability tree diagram
		Calculate probability of compound events from a tree diagram
		Compare experimental data with theoretical probability
		Understand that the same experiment repeated can have different results, and that increasing sample size increases accuracy
		Compare results from different sample sizes

17 [™] April	Congruence and	Understand that angles in similar shapes are the same
<u>EASTER</u>	similarity	Prove the congruence of triangles using SSS, SAS, ASA and RHS and formal argument
		Understand SSS, SAS, ASA and RHS in ruler and compass constructions
		Understand similarity of triangles and other 2D shapes,
		Use understanding of similar figures in problems
		Prove formally that two triangles are similar
	Using 2D	Use isometric grids
	represent 3D	Draw nets and show how they fold to make a 3D solid shape
	shapes	Understand and draw front and side elevations and plans of simple solids
		Draw a sketch of a 3D solid shape given the front and side elevations and plan of the solid
24 th April	Upper and lower bounds	Find the upper and lower bound of a calculation, especially in the calculation of:
		🗌 area
		🗌 volume
		Give a final answer to a calculation to an appropriate degree of accuracy using upper and lower bounds
	Solve linear	Solve a simple linear inequality with one variable
	inequalities	Show the solution to a linear inequality with one variable on a number line
	Perimeter and	Measure shapes to find perimeter or area
	area	☐ Find the perimeter of a rectangle or triangle
		Use a formula to find the area of a rectangle
		Use a formula to find the area of a triangle
		Use a formula to find the area of a parallelogram
		Use a formula to find the area of a trapezium
		Calculate the perimeter and area of compound shapes made from triangles, rectangles and other shapes
		Find the surface area of shapes such as prisms or pyramids by using the formulae for triangles, rectangles and other shapes

1st May	Circumference	\Box Find circumference of a circle using C = nd or C = 2nr
	circle	\Box Find the area of a circle using A = πr^2
		\Box Use π = 3.142 or the π button on a calculator
		☐ Find the perimeter and area of semcircles and quarter circles
		Calculate the length of an arc
		Calculate the area of a sector
		\Box Give answers in terms of π if required
		Find the surface area of a cylinder
	Maps and scale	Use, interpret and construct maps and scale drawings
	drawings	Draw lines and shapes to scale
		Estimate lengths using a scale diagram
	Comparing data	Compare two sets of data using shapes of distributions
		Compare two sets of data using averages and spread, such as median, range and quartiles
		Compare spread using box plots or cumulative frequency graphs
		Compare two pie charts
		Compare data from dual bar charts
		Understand the advantages and disadvantages of different types of average
8th May	Measure and	Measure and draw straight lines to the nearest mm
	draw lines and angles	☐
		↓ Make accurate drawings of triangles and other 2D shapes using ruler and
		protractor
		Make an accurate scale drawing from a diagram
		Use accurate drawing to solve bearings problems
	Rounding and	Round to the nearest integer (whole number)
		Round numbers to any given power of 10
		Round to a number of decimal places
		Round to a number of significant figures
		Estimate the answer to a calculation by using rounding
	Solve	
	simultaneous	
	equations with	Use substitution to solve simultaneous equations
		Draw straight line graphs and find the solution from the intersection of the two graphs
		Write simultaneous equations for a problem
15th May	Sequences	Understand odd and even numbers

		Generate number sequences from diagrams
		Describe the rule for a number sequence
		Find a particular term in a sequence, or explain why a particular number is not in a sequence
		Find the nth term expression for a sequence
		Use the nth term expression to find a number in the sequence
	Transformations	Rotations
		Rotate a 2D shape around the origin or other point
		Understand that a rotation is defined by an angle, direction and a centre of rotation
		Find the centre of rotation
		Understand that a rotation produces a shape congruent to the original
		Reflections
		Understand and describe reflections
		Identify the mirror line for a reflection, and find its equation
		Understand that a reflection produces a shape congruent to the original
		Translations
		Understand and use translations
		Understand that translations are defined by a distance and a direction using vector notation
		Translate a shape by a given vector
		Understand that a translation produces a shape congruent to the original
		Enlargements
		Understand that an enlargement is defined by a centre of enlargement and a scale factor
		Understand that angles remain the same in an enlargement
		\Box Enlarge a shape using (0, 0) or any other point as the centre
		Enlarge a shape by a positive scale factor
		Enlarge a shape by a fractional scale factor
		Enlarge a shape by a negative scale factor
		Find the centre of a given enlargement
		Identify the scale factor of a given enlargement
		Combined transformations
		Describe a transformation using a combination of rotation, reflection, translation or enlargements.
22 nd May		Thursday 25 th May Paper 1 Non Calculator
29 th May HALF TERM	Use a calculator effectively	 Simple and complex calculations, including involving time or money Use the following functions
		□ +, -, x, ÷

		Tuesday 13 th June Paper 3 Calculator
		L Find the area of a segment of a circle given the radius and length of the chord
		Use volumes in complex problems
		solid shapes, eg. a cuboid with pyramid on top, or cyclinder with cone on top.
		☐ Find the surface area or volume of a compound solid made up of other
		Find the volumes of cones, pyramids, spheres and hemispheres, frustrums
		Find the surface area of cubes, cuboids, cones, pyramids, spheres and hemispheres
		Find the volume of a cylinder
	and solids	Calculate the volume of a prism made from cuboids
	prisitis Complex shapes	Calculate volume of a prism, such as a triangular prism
	Volumes of	Use the formula to calculate the volume of a cuboid
		Interpret information on linear and non-linear graphs
	Real life graphs	Plot a linear graph
		Calculate the length of a line using coordinates
		Find the mid-point of a line
		Plot a point given the coordinates, in 2D or 3D
		Find the coordinates of a point
		Use axes and coordinates in 3D
		Understand and plot points in four quadrants
	Coordinates	Use axes and coordinates, both positive and negative in 2D
5 th June		Thursday 8 th June Paper 2 Calculcator
		U use a multiplier and the power key to calculate exponential growth or decay
		Use for dividing to do reverse percentage calculations
		Calculate in standard form
		numbers in standard form
		Understand that rounding too early can causes inaccuracy
		trigonometrical functions
		x to the power of 1 over y
		\Box x to the power of y
		brackets
		memory functions
		\Box x ² and \sqrt{x}

Suggested activities:

- Look through your exercise books to find any information on the topic.
- Make revision notes/mind map/prompt cards on all you know about the topic.
- Find any information you have about the topic from your revision guide, maths watch CD or mymaths website and any other resources your teacher has guided you to.
- Do some practice questions from revision guide, maths watch CD or mymaths website.
- Look back through mock papers or other exam papers you have. Find any questions you have done on the topic. Did you get them correct? If not try to correct them. Do you understand the method you used?

Other topics to think about:

- Vectors
 -] Functions
 - Iteration
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