Year 11 GCSE Revision - Maths Higher		
Week beginning	**Topics for revision**	**Re-visit work**
5th March	Expressions, Equations and Formulae	☐ Derive 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 exterior angles of polygons	☐ Calculate the sum of interior angles in a polygon ☐ 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
12th March	Circle Theorems	☐ Prove and use each of the circle theorems: ☐ 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
	Types of average and range	Calculate the following ☐ Mean ☐ Mode ☐ Modal class ☐ Median ☐ Interval containing the median ☐ Range ☐ 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
19th March	Index Laws	☐ Know all the square numbers from $2^2 = 4$ up to $15^2 = 225$ ☐ Know all the cube numbers from $2^3 = 8$ up to $5^3 = 125$ and also $10^3 = 1000$ ☐ Use index notation for squares and cubes, eg. 5^3 ☐ 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 ☐ Understand that for any number n, $n^0 = 1$ ☐ Understand that $n^{-1} = 1 / n$ ☐ Understand that $n^{1/2} = \sqrt{n}$ ☐ Understand that $n^{1/3} = \sqrt[3]{n}$

	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 measurements	☐ Know conversion factors between different metric units ☐ Convert between metric units ☐ Convert between imperial units, given the conversion factor ☐ Know rough imperial/metric equivalents as follows ☐ 1 kg = 2.2 pounds ☐ 1 litre = 1¾ pints ☐ 4.5 litres = 1 gallon ☐ 8 km = 5 miles ☐ 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 cm^3 = 1 ml
	Compound measures	☐ Understand and use compound measures, including speed and density
26th March	Fractions, Decimals and Percentages	☐ Find equivalent fractions ☐ 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 o VAT o Simple interest o Income tax o Compound interest o Depreciation o Prices after an increase or decrease o 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
2nd April **Easter**	Pythagoras' Theorem Trigonometry Surds	☐ 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 ☐ 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 ☐ Calculate the area of a triangle using the formulae $A = \frac{1}{2} ab \sin C$ ☐ Use surds (roots) calculations without a calculator, leaving the surd in the answer ☐ Give an answer to a Pythagoras question as $\sqrt{17}$ ☐ Manipulate surds in calculations, eg. $(3 - \sqrt{3})^2$ ☐ Rationalise a denominator, ie. manipulate so that there is no longer a surd on the bottom of the fraction

	Ratio	☐ Write a ratio in its simplest form ☐ Divide a quantity in a given ratio ☐ Solve problems using ratios
	Direct and indirect proportion	☐ Calculate an unknown quantity where quantities are in direct 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 intersecting lines, in triangles and quadrilaterals, and on parallel lines	☐ Angles round a point add up to 360° ☐ Angles on a straight line add up to 180° ☐ Perpendicular 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
9th April **Easter**	Graphs	☐ Draw, label and add a scale to axes ☐ Understand that an equation of the form y = mx + c corresponds to a straight line graph ☐ Plot straight line graphs from their equations ☐ 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 perpendicular lines	☐ Understand how the gradient of a real life graph relates to the relationship between the two variables ☐ Understand how the gradients of parallel lines are related

		☐ Understand how the gradients of perpendicular lines are related ☐ 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 $-\frac{1}{m}$ ☐ Generate equations of a line parallel or perpendicular to a straight line graph
	Simultaneous equations (one linear and one quadratic)	☐ Show the solution to several inequalities with two variables on a graph ☐ Find the intersection of a linear and a quadratic graph to find (approximate) solutions to simultaneous equations ☐ 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 ☐ Plot, sketch or recognise graphs of y = 1/x ☐ 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 ☐ 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 other functions	☐ Apply understanding of loci to construct graphs based on circles and perpendicular lines ☐ 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
16th April	Straight edge and compass constructions	☐ Construct a given triangle ☐ 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
	Bearings	☐ Use 3 figure bearings to specify direction ☐ 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 equations	☐ Solve quadratic equations by factorisation ☐ Solve quadratic equations by completing the square ☐ Solve quadratic equations using the quadratic formula
23rd April	Charts and diagrams	Draw the following charts or 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 graphs and diagrams	Understand and find information from ☐ pie charts ☐ 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
30th April	Probability	☐ Impossible, unlikely, even chance, likely and certain events ☐ 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 ☐ 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 ☐ Know and use the fact that, for mutually exclusive events, P(A **OR** B) = P(A) + P(B) ☐ 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

	Congruence and similarity	☐ Understand that angles in similar shapes are the same ☐ 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 diagrams to represent 3D shapes	☐ Use isometric grids ☐ Draw nets and show how they fold to make a 3D solid shape ☐ 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
7th May	Upper and lower bounds	Find the upper and lower bound of a calculation, especially in the calculation of: ☐ measurements ☐ perimeter ☐ area ☐ volume ☐ Give a final answer to a calculation to an appropriate degree of accuracy using upper and lower bounds
	Solve linear inequalities	☐ Solve a simple linear inequality with one variable ☐ Show the solution to a linear inequality with one variable on a number line
	Perimeter and area	☐ Measure shapes to find perimeter or 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

14th May	Circumference and area of a circle	☐ Find circumference of a circle using C = πd or C = 2πr ☐ Find the area of a circle using A = πr² ☐ 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 ☐ Give answers in terms of π if required ☐ Find the surface area of a cylinder
	Maps and scale drawings	☐ Use, interpret and construct maps and scale 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
21st May	Measure and draw lines and angles	☐ Measure and draw straight lines to the nearest mm ☐ Measure and draw angles to the nearest degree ☐ 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 approximation	☐ 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 two unknowns	☐ Use elimination to solve simultaneous equations ☐ 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

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?

Exam Dates

Thursday 24th May Paper 1 Non Calculator
Thursday 7th June Paper 2 Calculator
Tuesday 12th June Paper 3 Calculator