

## Revision 'Must Know' Checklist: Y10 Maths Higher Tier (Lower)



Below is a checklist of everything you must know to be successful by the end of this year.

Number	Algebra	Geometry and Measures	Ratio and Proportion	Statistics and Probability
<ul style="list-style-type: none"> <li>Estimate answers to multi-step calculations, including use of rounding numbers and formal estimation to 1 significant figure: mainly whole numbers and then decimals.</li> <li>Add and subtract numbers in standard form.</li> <li>Multiply and divide numbers in standard form.</li> <li>Interpret a calculator display using standard form and know how to enter numbers in standard form.</li> <li>Find the LCM and HCF of two numbers by listing and using prime factors.</li> <li>Use index laws to simplify and calculate the value of numerical expressions.</li> <li>Understand surd notation and simplify surd expressions involving squares.</li> <li>Expanding and simplifying single and double brackets involving surds.</li> <li>Rationalise the denominator of simple questions involving surds.</li> <li>Multiply and divide fractions, including mixed numbers and whole numbers and vice versa...</li> </ul>	<ul style="list-style-type: none"> <li>Use index laws to simplify and calculate the value of algebraic expressions.</li> <li>Factorise quadratic expressions of the form <math>x^2 + bx + c</math>, including using the difference of two squares.</li> <li>Form and solve linear equations to solve a problem.</li> <li>Substitute positive and negative numbers into a formula.</li> <li>Change the subject of a formula, including cases where the subject is on both sides of the original formula.</li> <li>Find and use to generate terms, the <math>n</math>th term of an arithmetic sequence.</li> <li>Use the <math>n</math>th term of an arithmetic sequence to decide if a given number is a term in the sequence or find the first term above or below a given number.</li> <li>Continue a quadratic sequence and use the <math>n</math>th term to generate terms and find the <math>n</math>th term.</li> <li>Distinguish between arithmetic and geometric sequences. Recognise and use simple geometric progressions.</li> </ul>	<ul style="list-style-type: none"> <li>Calculate the length of a line segment given the coordinates of the end points – Pythagoras.</li> <li>Find missing angles using the angle subtended by an arc at the centre of a circle is twice the angle subtended at any point on the circumference.</li> <li>Find missing angles using the angle in a semicircle is a right angle.</li> <li>Find missing angles using the perpendicular from the centre of a circle to a chord bisects the chord.</li> <li>Find missing angles using angles in the same segment are equal.</li> <li>Find missing angles using alternate segment theorem.</li> <li>Find missing angles using opposite angles of a cyclic quadrilateral sum to <math>180^\circ</math></li> <li>Find and give reasons for missing angles on diagrams using one or multiple circle theorems.</li> <li>Find and give reasons for missing angles on diagrams using isosceles triangles (radius properties) in circles.</li> </ul>	<ul style="list-style-type: none"> <li>Convert between currencies.</li> <li>Solve problems involving compound interest and depreciation.</li> <li>Work out the multiplier for repeated proportional change as a single decimal number.</li> <li>Find the original amount given the final amount after a percentage increase or decrease (reverse percentages).</li> <li>Set up and use equations to solve simple word and other problems involving inverse proportion. Relate algebraic solutions to graphical representation of the equations.</li> <li>Identify direct proportion from a table of values, by comparing ratios of values.</li> <li>Solve problems involving direct proportion or inverse proportion with squares, cubes or other powers/roots of another quantity, including using <math>k</math> to find another value.</li> <li>Know the relationships between linear, area and volume scale factors of mathematically similar shapes and solids. Find missing lengths, areas and volumes in similar 3D solids using scale factors</li> </ul>	<ul style="list-style-type: none"> <li>Calculate the mean, mode, median and range from a frequency table (discrete data).</li> <li>Construct and interpret grouped frequency tables for continuous data.</li> <li>Estimate the mean with grouped data.</li> <li>Find the interval which contains the median and the modal class.</li> <li>Produce and interpret pie charts.</li> <li>Construct and interpret time-series graphs.</li> <li>Produce box plots from raw data and when given quartiles, median and identify any outliers. Compare the median and interquartile range.</li> <li>Compare and interpret box plots to find median, quartiles, range and interquartile range and draw conclusions.</li> <li>Construct cumulative frequency tables and construct diagrams from tables.</li> <li>Interpret cumulative frequency diagrams. Find the median and quartile values and interquartile range.</li> </ul>

<ul style="list-style-type: none"> <li>• Add and subtract fractions, including mixed numbers.</li> <li>• Convert a recurring decimal to a fraction.</li> </ul>	<ul style="list-style-type: none"> <li>• Continue geometric progression and find term to term rule, including negative, fraction and decimal terms.</li> <li>• Identify and interpret the gradient and y-intercept of a linear graph given by equations of the form <math>y = mx + c</math>.</li> <li>• Sketch a graph of a linear function, using the gradient and y-intercept.</li> <li>• Find the equation of the line through one point with a given gradient.</li> <li>• Find the equation of a line through two points</li> <li>• Identify and interpret gradient from an equation <math>ax + by = c</math>. Find the equation of a straight line in this form and use to plot and draw straight lines.</li> <li>• Generate points and plot graphs of quadratic functions.</li> <li>• For a non-linear distance–time graph, estimate the speed at one point in time, from the tangent, and the average speed over several seconds by finding the gradient of the chord.</li> <li>• Draw a linear velocity–time graph (of individual sections) and find speed, time, acceleration, distance using enclosed areas by counting squares or using areas of trapezia, rectangles and triangles.</li> </ul>	<ul style="list-style-type: none"> <li>• Find the surface area of prisms including cubes, cuboids, and triangular prisms.</li> <li>• Find the surface area of a cylinder.</li> <li>• Calculate arc lengths, angles and areas of sectors of circles, include in terms of <math>\pi</math>.</li> <li>• Find the upper and lower bounds of calculations involving perimeters, areas and volumes of 2D and 3D shapes.</li> <li>• Recall and use the formula for volume of pyramid. Find the surface area of a pyramid.</li> <li>• Use the formulae for volume and surface area of spheres and cones, include in terms of <math>\pi</math>.</li> <li>• Convert between metric area and volume measures. Convert between metric measures of volume and capacity, e.g. <math>1 \text{ ml} = 1 \text{ cm}^3</math></li> <li>• Calculate and use the sums of the interior angles of polygons, find missing angles including irregular polygons.</li> <li>• Use the sum of the exterior angles of any polygon is <math>360^\circ</math>, and the sum of the interior angle and the exterior angle is <math>180^\circ</math> to find missing angles.</li> <li>• Calculate the length of a line segment AB given pairs of points using Pythagoras.</li> </ul>	<ul style="list-style-type: none"> <li>• Construct histograms from class intervals with unequal width.</li> <li>• Interpret histograms by finding frequencies and completing tables with missing information.</li> <li>• Draw and use a tree diagram to calculate conditional probabilities - without replacement.</li> <li>• Draw and find probabilities from Venn diagrams using set notation and 'given' worded questions.</li> </ul>
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