

International GCSE Mathematics Revision Checklist – Foundation

Topic – Numbers and the number system	Complete
Integers understand and use integers (positive, negative and zero) understand place value use directed numbers in practical situations order integers use the four rules of addition, subtraction, multiplication and division use brackets and the hierarchy of operations use the terms 'odd', 'even', 'prime numbers', ' <u>factors</u> ' and 'multiples' prime factors, common factors and common multiples	
Fractions understand and use equivalent fractions, simplifying a fraction by cancelling understand and use mixed numbers and vulgar fractions identify common denominators order fractions and calculate a given fraction of a given quantity express a given number as a fraction of another number use common denominators to add and subtract fractions and mixed numbers convert a fraction to a decimal or a percentage understand and use unit fractions as multiplicative inverses multiply and divide fractions and mixed numbers	
Decimals use decimal notation understand place value order decimals convert a decimal to a fraction or a percentage recognise that a terminating decimal is a fraction	
Powers and roots identify square numbers and cube numbers calculate squares, square roots, cubes and cube roots use index notation and index laws for multiplication and division including negative powers express integers as a product of powers of prime factors find highest common factors (HCF) and lowest common multiples (LCM)	
Set language and notation understand the definition of a set use the set notation $\cup$, $\cap$, $\in$, $\notin$, understand the concept of the universal set, E and the empty set, $\emptyset$ understand and use the complement of a set use Venn diagrams to represent sets	
Percentages understand that 'percentage' means 'number of parts per 100' express a given number as a percentage of another number express a percentage as a fraction and as a decimal understand the multiplicative nature of percentages as operators solve simple percentage problems, including percentage increase & decrease use reverse percentages	
Ratio and proportion use ratio notation, including its simplest form and links to fraction notation divide a quantity <u>in a given</u> ratio or ratios use the process of proportionality to evaluate unknown quantities calculate an unknown quantity from quantities that vary in direct proportion solve word problems about ratio and proportion	

Degree of accuracy round integers to a given power of 10 round to a given number of significant figures or decimal places identify upper and lower bounds where given to a degree of accuracy use estimation to evaluate approximations to numerical calculations	
Standard form calculate with and interpret numbers in the form $a \times 10^n$ where n is an integer and $1 \leq a < 10$	
Applying number use and apply number in everyday personal, domestic or community life carry out calculations using standard units of mass, length, area, volume and capacity	
Electronic calculators use a scientific electronic calculator to determine numerical results	

Topic – Equations, formulae and identities	Complete
Use of Symbols use index notation for positive and negative integer powers (including zero) use index laws in simple cases	
Algebraic manipulation evaluate expressions by substituting numerical values for letters collect like terms multiply a single term over a bracket take-out common factors expand the product of two simple linear expressions factorise quadratic expressions (limited to $x^2 + bx + c$)	
Expressions and formulae understand that a letter may represent an unknown number or a variable substitute into expressions and formulae use formulae expressed initially in words or diagrammatic form derive a formula or expression change the subject of a formula where the subject appears once	
Linear equations solve linear equations in which the unknown appears on either side of the equation solve linear equations in which the unknown appears on both sides of the equation set up simple linear equations from given data	
Simultaneous linear equations calculate the exact solution of two simultaneous equations in two unknowns	
Quadratic equations solve quadratic equations by factorisation	
Inequalities understand and use the symbols $<$, $>$, $\geq$ and $\leq$ understand and use the convention for open and closed intervals on a number line solve simple linear inequalities in one variable and represent on a number line represent simple linear inequalities on rectangular Cartesian graphs identify regions on rectangular Cartesian graphs defined by simple linear inequalities	

Topic – Sequences, functions and graphs	Complete
Sequences generate terms of a sequence using term-to-term and position-to-term find subsequent terms of an integer sequence and the rule for generating it use linear expressions to describe the n th term of arithmetic sequences	
Graphs interpret information presented in a range of linear and non-linear graphs understand and use conventions for rectangular Cartesian coordinates plot points (x, y) in any of the four quadrants or locate points with given coordinates determine the coordinates of the midpoint of a line segment draw and interpret straight line conversion graphs find the gradient of a straight line recognise that equations of the form $y = mx + c$ recognise, generate points and plot graphs of linear and quadratic functions	

Topic – Geometry and Trigonometry	Complete
Angles, lines and triangles use angle properties of intersecting lines, parallel lines and angles on a straight line angle properties of intersecting lines, parallel lines and angles on a straight line understand the exterior angle and the angle sum of triangle properties understand terms and properties of 'isosceles', 'equilateral' and 'right-angled triangles'	
Polygons recognise and give the names of polygons understand the term 'quadrilateral' and the angle sum property of quadrilaterals understand the properties of the parallelogram, rectangle, square, rhombus, trapezium and kite calculate interior and exterior angles of regular polygons understand and use the angle sum of polygons understand congruence as meaning the same shape and size	
Symmetry identify any lines of symmetry and the order of rotational symmetry of a given 2D figure	
Measures interpret scales on a range of measuring instruments Calculate time intervals in terms of the 24-hour and the 12-hour clock make sensible estimates of a range of measures understand angle measure including three-figure bearings measure an angle to the nearest understand and use the relationship between average speed, distance and time use compound measure such as speed, density and pressure	
Construction measure and draw lines to the nearest millimetre construct triangles and other 2D shapes using a ruler, a protractor and compasses solve problems using scale drawings construct the perpendicular bisector of a line segment and the bisector of an angle	
Circle properties recognise the terms 'centre', 'radius', 'chord', 'diameter', 'circumference', 'tangent', 'arc', 'sector' and 'segment' of a circle understand chord and tangent properties of circles	
Trigonometry and Pythagoras' theorem know, understand and use Pythagoras' theorem in two dimensions know, understand and use sine, cosine and tangent of acute angles to determine lengths and angles of a right-angled triangle apply trigonometrical methods to solve problems in two dimensions	
Mensuration of 2D shapes convert measurements within the metric system to include linear and area units find the perimeter of shapes made from triangles and rectangles find the area of shapes using the formulae for the areas of triangles and rectangles find the area of parallelograms and trapezia find circumferences and areas of circles; find perimeters and areas of semicircles	
3D shapes and volume recognise and give the names of solids understand the terms 'face', 'edge' and 'vertex' in the context of 3D solids find the surface area of simple shapes find the surface area of a cylinder find the volume of prisms, cuboids and cylinders, using an appropriate formula convert between units of volume within the metric system	

Topic – Geometry and Trigonometry	Complete
Similarity understand that similar figures have corresponding lengths in the same ratio, but corresponding angles remain unchanged use and interpret maps and scale drawings	
Transformation geometry rotate a shape about a point through a given angle recognise that an anti-clockwise rotation is a positive angle of rotation, and a clockwise rotation is a negative angle of rotation understand that reflections are specified by a mirror line construct a mirror line given an object and reflect a shape given a mirror line understand that translations are specified by a distance and direction translate a shape understand and use column vectors in translations understand that enlargements are specified by a centre and a scale factor understand that enlargements preserve angles and not lengths enlarge a shape given the scale factor identify and give complete descriptions of transformations	

Topic – Statistics and Probability	Complete
Graphical representation of data Use and interpret pictograms, bar charts, pie charts and two-way tables	
Statistical measures calculate the mean, median, mode and range for a discrete data set calculate an estimate for the mean for grouped data identify the modal class for grouped data	
Probability understand and use the probability scale understand and use estimates or measures of probability from theoretical models find probabilities from a Venn diagram understand how probability of an event can be determined from the sample space list all outcomes for single events and for two successive events in a systematic way estimate probabilities from previously collected data calculate the probability of the complement of an event happening use the addition rule of probability for mutually exclusive events understand and use the term 'expected frequency'	

