

International GCSE Mathematics Revision Checklist – Higher

Knowledge of the Foundation Tier content is assumed for students being prepared for the Higher Tier	
Topic – Numbers and the number system	Complete
Decimals convert recurring decimals into fractions	
Powers and roots manipulate surds, including rationalising a denominator use index laws to simplify numerical expressions involving integer, fractional and negative powers	
Set language and notation understand sets defined in algebraic terms, and understand and use subsets use Venn diagrams to represent sets and the number of elements in sets use the notation $n(A)$ for the number of elements in the set A	
Percentages use repeated percentage change solve compound interest problems	
Degree of accuracy solve problems using upper and lower bounds where values are given to a degree of accuracy	
Standard form solve problems involving standard form	

Topic – Equations, formulae and identities	Complete
Use of Symbols use index notation involving fractional, negative and zero powers	
Algebraic manipulation expand the product of two or more linear expressions understand and be able to factorise a quadratic expression manipulate algebraic fractions complete the square for a given quadratic expression use algebra to support and construct proofs	
Expressions and formulae change the subject where the subject may appear twice or a power of the subject occurs	
Proportion set up problems involving direct or inverse proportion and relate algebraic solutions to graphical representation of the equations	
Simultaneous linear equations calculate the exact solution of two simultaneous equations in two unknowns interpret the equations as lines and the common solution as the point of intersection	
Quadratic equations solve quadratic equations by factorisation solve quadratic equations by using the quadratic formula or completing the square form and solve quadratic equations from data given in a context solve simultaneous equations in two unknowns, one being linear and the other being quadratic	
Inequalities solve quadratic inequalities in one unknown and represent the solution set on a number line identify harder examples of regions defined by linear inequalities	

Topic - Sequences, functions and graphs	Complete
Sequences understand and use common difference (d) and first term (a) in an arithmetic sequence know and use n th term $= a + (n-1)d$ the sum of the first n terms of an arithmetic series (S_n)	
Function notation understand the concept that a function is a mapping between elements of two sets use function notations of the form $f(x) = \dots$ and $f : x \rightarrow \dots$ understand the terms 'domain' and 'range' and which values may need to be excluded from a domain understand and find the composite function fg and the inverse function f^{-1}	
Graphs recognise, plot and draw graphs with equation: $y = Ax^3 + Bx^2 + Cx + D$ apply to the graph of $y = f(x)$ the transformations $y = f(x) + a$, $y = f(ax)$, $y = f(x + a)$, $y = af(x)$ for linear, quadratic, sine and cosine functions interpret and analyse transformations of functions and write the functions algebraically find the gradients of non-linear graphs find the intersection points of two graphs, one linear and one non-linear calculate the gradient of a straight line given the coordinates of two points find the equation of a straight line parallel or perpendicular to a given line	
Calculus differentiate integer powers of x determine gradients, rates of change, stationary points, turning points (maxima and minima) by differentiation and relate these to graphs distinguish between maxima and minima by the general shape of the graph apply calculus to linear kinematics and to other simple practical problems	

Topic – Geometry and Trigonometry	Complete
Circle properties and theorems understand and use the internal and external intersecting chord properties recognise the term 'cyclic quadrilateral' understand and use angle subtended by an arc at the centre of a circle is twice the angle subtended at any point on the remaining part of the circumference understand and use angle subtended at the circumference by a diameter is a right angle understand and use angles in the same segment are equal understand and use the sum of the opposite angles of a cyclic quadrilateral is 180° understand and use the alternate segment theorem	
Geometrical reasoning provide reasons for angles obtained in any geometrical context involving lines, polygons and circles	
Trigonometry and Pythagoras' theorem understand and use sine, cosine and tangent of obtuse angles understand and use angles of elevation and depression understand and use the sine and cosine rules for any triangle use Pythagoras' theorem in three dimensions understand and use the formula $\frac{1}{2} ab \sin C$ for the area of a triangle	
Mensuration of 2D shapes find perimeters and areas of sectors of circles	
3D shapes and volume find the surface area and volume of a sphere and a cone using relevant formulae	
Similarity understand that areas of similar figures are in the ratio of the square of corresponding sides understand that volumes of similar figures are in the ratio of the cube of corresponding sides use areas and volumes of similar figures in solving problems	

Topic – Vectors and transformation geometry	Complete
Vectors	
understand that a vector has both magnitude and direction	
understand that a vector has both magnitude and direction	
multiply vectors by scalar quantities	
and subtract vectors	
calculate the modulus (magnitude) of a vector	
find the resultant of two or more vectors	
apply vector methods for simple geometrical proofs	

Topic – Statistics and Probability	Complete
Graphical representation of data	
construct and interpret histograms	
construct cumulative frequency diagrams from tabulated data	
use cumulative frequency diagrams	
Statistical measures	
estimate the median from a cumulative frequency diagram	
understand the concept of a measure of spread	
find the interquartile range from a discrete data set	
estimate the interquartile range from a cumulative frequency diagram	
Probability	
draw and use tree diagrams	
determine the probability that two or more independent events will occur	
use simple conditional probability when combining events	



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