Maths Year 11 Mock Revision list

F = Foundation Tier
F/H = Foundation and Higher Tier
H = Higher Tier

Number

Tier	Topic	
F/H	know and use the word integer and the equality and inequality symbols	
F/H	use fractions, decimals or percentages to find quantities	
F/H	recognise integers as positive or negative whole numbers, including zero	
F/H	add, subtract, multiply and divide using commutative, associative and distributive laws	
F/H	solve problems set in words	
F/H	identify multiples, factors and prime numbers from lists of numbers	
F/H	write a number as the product of its prime factors and use formal (eg using Venn diagrams) and informal methods (eg trial and error) for identifying highest common factors (HCF) and lowest common multiples (LCM)	
F/H	work out a root of a number from a product of prime factors	
F/H	understand the notation and be able to work out the value of squares, cubes and powers of 10	
F/H	use index laws for multiplication and division of integer powers	
F/H	calculate with positive integer indices	
H	calculate values using fractional indices	
H	calculate with positive and negative integer indices	
H	use index laws for multiplication and division of positive, negative and fractional indices	
F/H	identify equivalent fractions	
F/H	write a fraction in its simplest form	

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F/H	give answers in terms of π and use values given in terms of π in calculations.	
F/H	know, use and understand the term standard from	
F/H	write an ordinary number in standard form	
F/H	write a number written in standard form as an ordinary number	
F/H	order and calculate with numbers written in standard form	
F/H	solve simple equations where the numbers are written in standard form	
F/H	use a calculator effectively for standard form calculations	
F/H	solve standard form problems with and without a calculator	
F/H	compare the value of fractions and decimals	
H	convert recurring decimals into fractions	
H	convert fractions into recurring decimals	
H	use formal algebraic methods to convert recurring decimals into fractions	
F/H	understand the meaning of ratio notation	
F/H	interpret a ratio as a fraction	
F/H	use fractions and ratios in the context of geometrical problems, for example similar shapes, scale drawings and problem solving involving scales and measures	
F/H	understand that a line divided in the ratio 1 : 3 means that the smaller part is one-quarter of the whole	
F/H	calculate a fraction of a quantity	
F/H	calculate a percentage of a quantity	
F/H	convert between fractions, decimals and percentages to find the most appropriate method of calculation in a question; for example, 62% of £80 is 0.62 × £80 and 25% of £80 is £80 ÷ 4	
F/H	know and use standard metric and imperial measures	
F/H	know and use compound measures such as area, volume and speed	

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F/H	perform money calculations, writing answers using the correct notation	
F/H	round numbers to the nearest whole number, 10, 100 or 1000	
F/H	round numbers to a specified number of decimal places	
F/H	round numbers to a specified number of significant figures	
H	write down the maximum or minimum figure for a value rounded to a given accuracy	
H	combine upper or lower bounds appropriately to achieve an overall maximum or minimum for a situation	
H	work with practical problems involving bounds including in statistics. For example, finding the midpoint of a class interval, such as $10 < t \leqslant 20$, in order to estimate a mean	

Algebra

F/H	substitute numbers into a formula	
F/H	understand phrases such as ‘form an equation’, ‘use a formula’, ‘write down a term’, ‘write an expression’ and ‘prove an identity’ when answering a question	
F/H	manipulate an expression by collecting like terms	
F/H	write expressions to solve problems	
F/H	multiply two linear expressions, such as $(x \pm a)(x \pm b)$ and $(cx \pm a)(dx \pm b)$, for example $(2x + 3)(3x - 4)$	
F/H	multiply a single term over a bracket, for example, $a(b + c) = ab + ac$	
F/H	know the meaning of and be able to simplify, for example $3x - 2 + 4(x + 5)$	
F/H	know the meaning of and be able to factorise, for example $3x^2y - 9y$ or $4x^2 + 6xy$	
F/H	factorise quadratic expressions using the sum and product method, or by inspection (FOIL)	
F/H	factorise quadratics of the form $x^2 + bx + c$	

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F/H	use the index laws for multiplication and division of integer powers	
F/H	simplify algebraic expressions, for example by cancelling common factors in fractions or using index laws	
H	factorise quadratic expressions of the form $ax^2 + bx + c$	
F/H	change the subject of a formula	
F/H	use algebraic expressions to support an argument or verify a statement	
H	understand and use function notation, for example f(x)	
H	substitute values into a function, knowing that, for example f(2) is the value of the function when $x = 2$	
H	understand, interpret and use composite function fg(x)	
H	understand, interpret and use inverse function $f^{-1}(x)$	
F/H	plot points in all four quadrants	
F/H	recognise that equations of the form $y = mx + c$ correspond to straight-line graphs in the coordinate plane	
F/H	complete tables of values for straight-line graphs	
F/H	calculate the gradient of a given straight-line given two points or from an equation	
F/H	manipulate the equations of straight lines so that it is possible to tell whether lines are parallel or not	
H	work out the gradients of lines that are parallel and perpendicular to a given line	
H	manipulate the equations of straight lines so that it is possible to tell whether or not lines are perpendicular	
H	know that the gradients of perpendicular lines are the negative reciprocal of each other	
F/H	recognise that equations of the form $y = mx + c$ correspond to straight-line graphs in the coordinate plane with gradient m and y-intercept at (0, c)	
F/H	work out the gradient and the intersection with the axes	
H	complete the square	

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H	deduce turning points by completing the square	
F/H	draw, sketch, recognise and interpret linear functions	
F/H	plot and interpret distance-time graphs	
F/H	interpret line graphs from real-life situations, for example conversion graphs	
F/H	solve simple linear equations by using inverse operations or by transforming both sides in the same way	
F/H	solve simple linear equations with integer coefficients where the unknown appears on one or both sides of the equation or where the equation involves brackets	
F/H	solve quadratic equations by factorising	
F/H	read approximate solutions to a quadratic equation from a graph	
H	solve quadratic equations by factorising, completing the square or using the quadratic formula	
H	solve geometry problems that lead to a quadratic equation that can be solved by using the quadratic formula	
F/H	set up simple linear equations	
F/H	set up a pair of simultaneous linear equations to solve problems	
F/H	generate linear sequences	
F/H	work out the value of the *n*th term of a linear sequence for any given value of *n*	
H	work out the value of the *n*th term of a sequence for any given value of *n*	
F/H	work out a formula for the *n*th term of a linear sequence	
F/H	work out an expression in terms of *n* for the *n*th term of a linear sequence by knowing that the common difference can be used to generate a formula for the *n*th term	
H	work out a formula for the *n*th term of a sequence, which may contain linear or quadratic parts	

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Ratio, proportion and rates of change

F/H	use conversions between imperial units and metric units using common approximations, for example 5 miles ≈ 8 kilometres, 1 gallon ≈ 4.5 litres, 2.2 pounds ≈ 1 kilogram, 1 inch ≈ 2.5 centimetres	
F/H	make comparisons between two quantities and represent them as a ratio	
F/H	compare the cost of items using the unit cost of one item as a fraction of the unit cost of another item	
F/H	use equality of ratios to solve problems	
F/H	understand the meaning of ratio as a fraction	
F/H	represent the ratio of two quantities in direct proportion as a linear relationship and represent the relationship graphically	
F/H	relate ratios to fractions and use linear equations to solve problems	
F/H	use percentages in real-life situations	
F/H	solve percentage increase and decrease problems, for example, use $1.12 \times Q$ to calculate a 12% increase in the value of Q and $0.88 \times Q$ to calculate a 12% decrease in the value of Q	
F/H	solve simple interest problems	
F/H	use direct proportion to solve geometrical problems	
F/H	calculate an unknown quantity from quantities that vary in direct proportion or inverse proportion	
F/H	set up and use equations to solve word and other problems involving direct proportion or inverse proportion	
F/H	recognise the graphs that represent direct and inverse proportion	
F/H	understand speed and know the relationship between speed, distance and time	
F/H	understand that an equation of the form $y = kx$ represents direct proportion and that k is the constant of proportionality	
F/H	understand that an equation of the form $y = \frac{k}{x}$ represents inverse proportion and that k is the constant of proportionality	

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Geometry and measures

F/H	know that vertically opposite angles are equal	
F/H	work out the size of missing angles at a point	
F/H	work out the size of missing angles at a point on a straight line	
F/H	identify shapes that are congruent	
F/H	understand and use conditions for congruent triangles: SSS, SAS, ASA and RHS	
F/H	recognise congruent shapes when rotated, reflected or in different orientations	
F/H	understand and use SSS, SAS, ASA and RHS conditions to prove the congruence of triangles using formal arguments, and to verify standard ruler and compass constructions	
F/H	understand similarity	
F/H	understand similarity of triangles and of other plane figures, and use this to make geometric inferences	
F/H	describe and transform 2D shapes using single rotations	
F/H	find a centre of rotation	
F/H	measure the angle of rotation using simple fractions of a turn or degrees	
F/H	find the equation of a line of reflection	
F/H	describe and transform 2D shapes using translations	
F/H	translate a given shape by a vector	
F/H	describe and transform 2D shapes using enlargements by a positive scale factor	
F/H	draw an enlargement	
F/H	find the centre of enlargement	
F/H	enlarge a shape on a grid (centre not specified)	
F/H	use congruence to show that translations, rotations and reflections preserve length and angle, so that any figure is congruent to its image under any of these transformations	

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H	identify the scale factor of an enlargement	
H	construct enlargements with fractional and negative scale factors	
H	describe and transform 2D shapes using combined rotations, reflections, translations, or enlargements	
H	describe a combination of transformations as a single transformation	
H	understand and use the term ‘invariance’ for points, lines and shapes achieved by single or combined transformations	
H	map a point on a shape under a combination of transformations	
H	use column vector notation for translations	
H	prove and use the fact that the angle subtended by an arc at the centre of a circle is twice the angle subtended at any point on the circumference	
H	prove and use the fact that the angle subtended at the circumference by a semicircle is a right angle	
H	prove and use the fact that angles in the same segment are equal	
H	prove and use the fact that opposite angles of a cyclic quadrilateral sum to 180°	
H	prove and use the alternate segment theorem	
H	identify and name common solids, for example cube, cuboid, prism, cylinder, pyramid, cone and sphere	
F/H	understand that cubes, cuboids, prisms and cylinders have uniform areas of cross-section	
F/H	recall and use the eight points of the compass (N, NE, E, SE, S, SW, W, NW) and their equivalent three-figure bearings	
F/H	use compass point and three-figure bearings to specify direction	
F/H	draw a bearing between points on a map or scale drawing	
F/H	measure the bearing of a point from another given point	
F/H	work out the bearing of a point from another given point	
F/H	work out the area of a rectangle	

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F/H	work out the area of a triangle	
F/H	work out the area of a parallelogram	
F/H	work out the area of a trapezium	
F/H	calculate the area of compound shapes made from triangles and rectangles	
F/H	calculate the area of compound shapes made from two or more rectangles, for example an L shape or T shape	
F/H	recall and use the formula for the volume of a cube or cuboid	
F/H	recall and use the formula for the volume of a cylinder	
F/H	recall and use the formula for the volume of a prism	
F/H	work out the volume of a cube or cuboid	
F/H	work out the volume of a cylinder	
F/H	work out the volume of a prism, for example a triangular prism	
F/H	work out the perimeter of a rectangle	
F/H	work out the perimeter of a triangle	
F/H	calculate the perimeter of shapes made from triangles and rectangles	
F/H	calculate the perimeter of compound shapes made from two or more rectangles	
F/H	calculate the perimeter of shapes drawn on a grid	
F/H	calculate the perimeter of simple shapes	
F/H	recall and use the formula for the circumference of a circle	
F/H	work out the circumference of a circle, given the radius or diameter	
F/H	work out the radius or diameter of a circle, given the circumference	
F/H	use π = 3.14 or the π button on a calculator	
F/H	recall and use the formula for the area of a circle	
F/H	work out the area of a circle, given the radius or diameter	

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F/H	work out the radius or diameter of a circle, given the area	
F/H	work out the surface area of spheres, pyramids and cones	
F/H	work out the surface area of compound solids constructed from cubes, cuboids, cones, pyramids, cylinders, spheres and hemispheres	
F/H	work out the volume of spheres, pyramids and cones	
F/H	work out the volume of compound solids constructed from cubes, cuboids, cones, pyramids, cylinders, spheres and hemispheres	
F/H	calculate the length of arcs of circles	
F/H	calculate the area of sectors of circles	
F/H	understand, recall and use Pythagoras' theorem in 2D problems	
F/H	understand, recall and use trigonometric ratios in right-angled triangles	
F/H	use the trigonometric ratios in right-angled triangles to solve problems, including those involving bearings	
H	understand, recall and use Pythagoras' theorem in 3D problems	
H	understand, recall and use trigonometric ratios in 3D problems	
F/H	recall exact values of sine, cosine and tangent for 0°, 30°, 45° and 60°	
F/H	recall that sin 90° = 1 and cos 90° = 0	
F/H	solve right-angled triangles with angles of 30°, 45° or 60° without using a calculator	
H	use the sine and cosine rules to solve 2D and 3D problems	
F/H	understand and use vector notation for translations	
F/H	use column vector notation to describe a translation in 2D	
F/H	understand and use vector notation	
F/H	calculate the resultant of two vectors	
F/H	understand and use the commutative and associative properties of vector addition	

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Probability

F/H	complete a frequency tree from given information	
F/H	estimate probabilities by considering relative frequency	
F/H	appreciate that the sum of the probabilities of all possible mutually exclusive outcomes has to be 1	
F/H	solve problems given a Venn diagram	
F/H	design and use frequency trees	
F/H	complete a tree diagram to show outcomes and probabilities	
F/H	use a tree diagram as a method for calculating probabilities for independent or dependent events	
H	complete a tree diagram to show outcomes and probabilities	
H	use a tree diagram as a method for calculating conditional probabilities	
H	use a Venn diagram as a method for calculating conditional probabilities	

Statistics

H	construct suitable diagrams for grouped discrete and continuous data	
H	interpret diagrams for grouped discrete and continuous data	
F/H	calculate an estimate of the mean for a grouped frequency distribution, knowing why it is an estimate	
F/H	find the interval containing the median for a grouped frequency distribution	
F/H	choose an appropriate measure to be the ‘average’, according to the nature of the data	
H	calculate quartiles and inter-quartile range from a small data set using the positions of the lower quartile and upper quartile respectively	
H	read off lower quartile, median and upper quartile from a cumulative frequency diagram or a box plot and calculate inter-quartile range	
H	find an estimate of the median or other information from a histogram	

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F	understand that just because a correlation exists, it does not necessarily mean that causality is present	
F	draw a line of best fit by eye for data with strong enough correlation, or know that a line of best fit is not justified due to the lack of correlation	
F	understand outliers and make decisions whether or not to include them when drawing a line of best fit	
F	use a line of best fit to estimate unknown values when appropriate	
F	look for unusual data values such as a value that does not fit an otherwise good correlation	

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