GCSE HIGHER MATHSWATCH REVISION SHEETS

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Year 9 Summer Term

Expressions - Chapter 2	
To understand the words expression, equation, formula, term and factor.	137 (first 4 minutes)
Be able to use algebraic notation - write instructions like multiply 2 by x as 2x.	7
To substitute numbers into expressions.	95
Change worded problems into algebra, then use the formula. E.g, a car hire company charges £100 plus £30 per day. Write a formula for the cost of hiring.	137
To simplify expressions by collecting the like terms.	33
Simplify expressions involving products and using the laws of indices e.g. $a^2 \times a^3$.	34, 35, 131
Simplify algebraic expressions like $\frac{x+4}{6} + \frac{2x-1}{5}$	210a (from 5:53)
To expand brackets like 3(x+4)=3x+12.	93
To expand and simplify expressions with more than one bracket eg 3(2x+3)+2(5x+4).	134a
To factorise expressions like 15x+25=5(3x+5).	94
Data Handling - Chapter 4	
Understand sampling methods like random sampling. Give advantages and disadvantages of different types of sampling methods. Understand bias.	63, 152
Calculate a stratified sample.	176
Organise data into frequency tables and two-way tables.	61, 65a,
Organise data into stem and leaf diagrams.	128b
Organise data into back-to-back stem and leaf diagrams.	
Organise data into pictograms, bar charts and vertical line graphs.	15, 16, 64,
Organise data into pie charts.	128a
Find the mean, median, mode and range of data. Find the mean of combined data sets. Give advantages and disadvantages of the averages.	62
Find the mean, median, mode and range from a frequency table. Compare data sets.	130a,b
Find the interquartile range of a set of data.	

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Year 10 Autumn

Calculations - Chapter 1	
Understand place value. Writing numbers in words and figures.	1
Use place value. Questions like, if 15x14=210 find 2.10÷1.5 without a calculator.	92
Put lists of whole numbers and decimals in order.	2, 3
Read scales.	4
Use < and > properly.	5
Round numbers to nearest 10,100, 1000.	31
Round numbers to 1,2 and 3 decimal places. Round numbers to significant figures.	32, 90
Multiply and divide by 10, 100, 1000.	30
Add and subtract numbers, including negative numbers using mental and written methods.	17, 18, 68a
Multiply and divide numbers, including negative numbers using mental and written methods.	19, 20, 66, 67, 68b
Negative numbers in real life.	23
Do a calculation in the correct order using BIDMAS.	75
Fractions, Decimals and Percentages - Chapter 5	
Put a list of fractions in order.	70
Find equivalent fractions. Simplify a Fraction. Find a reciprocal of a fraction.	24, 25, 26, 76
Find fractions of amounts.	72
Find percentages of amounts.	40, 86, 87
Calculations on fractions and mixed numbers involving + and -. Change a mixed number into an improper (top heavy) fraction and back again.	71
Calculations on fractions and mixed numbers involving x and ÷.	73, 74
Convert between fractions, decimals, and percentages. Order fractions, decimals, and percentages.	84, 85
Change to a percentage.	88, 89
Understand recurring decimals. Use dot notation to write them.	177
Prove $0.4\dot{9} = \frac{1}{2}$ using algebra.	189
Angles and Polygons - Chapter 3	
Know properties of special types of triangles and quadrilaterals. Know properties of parallel and perpendicular lines.	9
Understand properties of angles at a point and on a straight line.	13, 45
Find angles in parallel lines and use key words like alternate or corresponding.	120
Use bearings to specify direction.	124
Find angles in special triangles.	121, 122
Decide when shapes are congruent and prove it. Use schemes of congruence for triangles like Side-Angle-Side (SAS)	12b, 166
Understand similar shapes and calculate missing sides in similar shapes. Find the scale factor.	144
Understand symmetry, both line and rotational. Names of polygons.	10, 11
Find the internal and external angles in polygons. Find missing angles in polygons.	123
Formula and Functions - Chapter 6	
Substituting numbers into formulae .	95
Writing formulae from a worded problem.	137
Rearranging formula to changing the subject.	101, 136
Rearranging harder equations where the subject appears twice	190
Identify and use the terms expression, term, factor, inequalities, equations, formulae and identities.	137 (first 4 minutes)
Expanding double brackets.	134b
Product of three binomials (expanding three brackets).	178
Factorising expressions into double brackets.	157
Factorising hard quadratics.	192

Factorising the difference of two squares.	158
Construct proofs of simple statements using algebra. Proving statements in algebra and disproving statements by counter-example.	156, 193
Represent functions and find inputs and outputs. Find the inverse of a function $f^{-1}(x)$	214a, 214b
Find composite functions.	215
Simplifying algebraic fractions by factorising	210 (up to 5:53)
Working in 2D - Chapter 7	
Use standard metric units of measure for length.	112
Use Coordinates	8, 113
Measure lines and angles,	13, 46a,b
Use bearings.	124
Interpret maps and scale drawings.	38
Recognise 2D shapes. Find the perimeter of 2D shapes.	9, 52
Symmetries in 2D shapes.	11
Find the area of 2D shapes, including rectangles, triangles, parallelograms and trapeziums. Find area of compound shapes.	53, 54, 55,56
Transforming shapes by rotation, reflection and translation. Use a column vector to describe a translation.	48, 49, 50
Transforming shapes by enlargement for integer and fractional scale factors. Find the scale factor.	148
Transforming shapes by enlargement for negative scale factors.	181a,b,
Identify what changes and what is invariant under a combination of transformations.	182
Measures and Accuracy - Chapter 9	
Round numbers and measures to an appropriate degree of accuracy.	31, 32, 90
Estimate the answer to calculations by rounding to one significant figure. Check calculations using approximations and estimation.	91
Money questions – non calculator.	22a
Use a calculator. Money questions – calculator.	77, 22b
Use standard units of length, mass, volume, capacity, time and area.	6a,b, 112,
Solve problems involving speed and density.	142
Giving the upper and lower bounds of numbers	132
Use inequality notation to state error intervals.	155
Calculations involving the upper and lower bound.	206

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Year 10 Spring

Y10 Assessment Week

Factors, Powers and Roots - Chapter 13	
Factors, primes, and multiples	28
Express a number as a product of prime factors.	78
Find the highest common factor (HCF) and lowest common multiple (LCM) of pairs of numbers. Use prime factors to find the HCF and LCM. Write the HCF and LCM using product notation (powers).	79, 80
Understand powers of numbers like cube and square. Also, the cube and square root. Understand indices like $3^4=3x3x3x3$	81, 82
Recognise powers of 2, 3, 4, and 5.	29
Understand the rules of indices. (Power rules like $3^4x3^2=3^6$)	34, 35
Understand irrational numbers and surds.	207a
Be able to simplify surds.	207b
To be able to rationalise denominators when they contain surds.	207c
Linear Equations - Chapter 10 (10.1,10.2)	
Understand inverse operations.	21
Solve simple linear equations by balancing them, inc. equations with brackets and fractions and unknowns on both sides.	135a
Form and solve simple linear equations. Solving problems which combine the perimeter and area of shapes with algebra.	137
Linear & Quadratic Equations - Chapter 10 (10.1,10.2)	
Solve simple linear equations by balancing them, inc. equations with brackets and fractions and unknowns on both sides.	135a
Form and solve simple linear equations. Solving problems which combine the perimeter and area of shapes with algebra.	137
Solving quadratic equations by factorising.	157
Solving quadratic equations by completing the square	209a,b
Solving quadratic equations by using the quadratic formula.	191
To solve equations involving algebraic fractions like $\frac{x+4}{6}+\frac{2x-1}{5}=6$	210b
Linear Graphs & Functions - Chapter 14 (14.1,14.2)	
Drawing straight line graphs. Drawing vertical and horizontal graphs from equations like y=2 and x=3. Decide whether a given point lies on the graph.	96, 99 (up to 5:12)
Find gradient of a line. Interpret gradient as rate of change.	97
Midpoint of a line.	133
Find equation of a straight line (y=mx+c). Understand and identify gradient and intercept.	159a
Identify parallel lines. Use one point and gradient to find equation of a line.	159b (up to 4:42)
Use two points to find gradient and equation of a line.	159b (from 4:42)
Linear & Quadratic Graphs & Functions - Chapter 14 (14.2S,14.3)	
Drawing straight line graphs. Drawing vertical and horizontal graphs from equations like y=2 and x=3. Decide whether a given point lies on the graph.	96, 99 (up to 5:12)
Drawing a quadratic graph.	98, 99 (after 5:12)
Identify roots, intercepts and turning points of quadratic graphs.	160
Completing the square to be able to sketch a quadratic curve.	209c
Probability - Chapter 8	
Understanding basic probability, including the probability scale. Calculating the theoretical probability of an event happening.	14, 59
Experimental probabilities (relative frequency). Calculating the expected frequency.	125
Mutually exclusive events. Know that the probabilities of all the outcomes of an event sum to 1.	60
Listing Strategies.	58, 69
Drawing sample space (possibility space) diagrams.	126
Simultaneous Equations and Inequalities, and Kinematic graphs - Chapter 10 (10.4,10.5) & 14 (14.3)	
Solving linear simultaneous equations by elimination.	162
Solving simultaneous equations graphically.	140

Solving linear inequalities and showing the solution on a number line.	138, 139
Kinematics graphs (speed-time or distance-time). Calculating the gradient of these graphs to get the speed or acceleration.	143, 216a (up to 6:56)
Simultaneous Equations and Inequalities,and Solving Graphically - Chapter 10 (10.3-5) & 14 (14.2A)	
Solving linear simultaneous equations by elimination.	162
Solving simultaneous equations involving a linear one and a quadratic one by substitution.	211
Solving simultaneous equations graphically.	140
Using iteration to solve equations.	179, 180
Solving linear inequalities by balancing and showing the solution on a number line.	138, 139
Representing inequalities as regions on a 2D graph.	198
Solving Quadratic inequalities.	212

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Year 10 Summer

Circles and Constructions - Chapter 11	
Parts of a circle.	116, 149
Find the area and circumference of a circle. Solve problems involving circles and part circles (like semi-circles). Find the perimeter of a semicircle.	117, 118,
Find the length of an arc and the area of a sector.	167
Construct triangles using compasses and protractor. Construct a 60 degree angle.	147
Understand and draw loci	146
Understand and use circle theorems.	183
Prove the circle theorems.	184
Quadratic Equations and Graphs - Chapter 10 (10.3) & 18 (18.1)	
Solving quadratic equations by factorising.	157
Drawing a quadratic graph.	98, 99 (after 5:12)
Identify roots, intercepts and turning points of quadratic graphs.	160
Equations of Straight Lines & Kinematics - Chapter 14 (14.1,14.4)	
Find gradient of a line. Interpret gradient as rate of change.	97
Midpoint of a line.	133
Find equation of a straight line (y=mx+c). Understand and identify gradient and intercept. Identify parallel lines. Use one point and gradient to find equation of a line. Use two points to find gradient and equation of a line.	159a,b
Find the equation of a perpendicular line.	208
Kinematics graphs (speed-time or distance-time). Calculating the gradient of these graphs to get the speed or acceleration. Find the area under speed-time graphs to find the distance travelled.	143, 216a
Ratio and Proportion - Chapter 12	
Change between fractions, decimals and percentages. Put lists of fractions, decimals and percentages in order.	84, 85
Work out one number as a fraction or percentage of another.	88, 89
Compare proportions. Find equivalent fractions.	25, 70
Simplify ratios. Use the ratio 1:n or n:1 (called a scale). Use scale factors, scales diagrams and maps.	38, 165a
Divide quantities in a ratio. Compare parts using ratio.	106
Solve ratio problems – recipe questions, combining ratios	39, 165b
Ratios and fractions.	107, 165c
Advanced ratio questions	200a,b,c
Calculate a percentage of an amount.	86, 87
Work out percentage increase or decrease using both a non-calculator method and by a decimal multiplier on a calculator.	108
Solve percentage change problems.	109
Reverse percentage problems.	110
Work out simple interest (investing money into a bank)	111
Y10 Assessment Week	
Calculations 2 - Chapter 17	
Calculate roots and indices. Use the rules of indices.	29, 82, 131
Negative and fractional indices.	154, 188
Give answers to calculations as exact numbers (in terms of pi).	End of clip 117
Give answers to calculations as exact numbers inc. surds.	207a,b
Work with numbers in standard form. Calculations in standard form.	83

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Year 11 Autumn

Pythagoras and Trigonometry - Chapter 19	
Use Pythagoras' theorem to find the hypotenuse or short side on a right-angled triangle – a simple approach.	150a
Use Pythagoras' theorem to find the hypotenuse or short side on a right-angled triangle. Apply Pythagoras' theorem to problems.	150b
Use Pythagoras to find the length of a line segment between coordinates like (2,4) and (5,8).	150c
Apply Pythagoras in 3D.	217
Find angles and sides in right angled triangles using trigonometry (SOH CAH TOA). Solve problems involving trigonometry.	168
Know exact values of sin 30, cos 60 etc so that you can do trigonometry questions on the non-calculator paper.	173
The sine rule. The cosine rule. Apply the cosine rule to bearings questions.	201, 202
Find the area of a triangle using 1/2absinC.	203
Apply trigonometry in 3D.	218
Understand what a vector is, how to write them and how to combine them in diagrams.	174
Understand that parallel vectors are multiples of each other.	219 up to 12 minutes
Prove statements using vectors such as whether lines are parallel or collinear.	219 after 12 mins
Chapter 22 Units and proportionality	
Solve problems on compound units (Speed, Density, Pressure) and understand problems involving rate.	142
Compare lengths, areas, and volumes of similar shapes. Work out volumes and areas in mathematically similar shapes.	112
To convert units such as $6m^2$ into cm^2.	201
Value for money. Exchanging money.	41, 105
Understand problems in direct proportion and the unitary method. Know the graph of two variables in direct proportion y=kx.	42, 199
Understand problems in inverse proportion. Know the graph y=k/x for inverse proportion.	199
Increase and decrease amounts by percentage multipliers.	108
Be able to work out simple interest.	111
Work out repeated proportional changes (including compound interest). Interpret growth and decay problems.	164
Find the rate of change on linear graphs and on curves by adding in a tangent line.	216b
Y11 Assessment Week	
Chapter 18 Graphs 2 (18.2, 18.3)	
Recognise, sketch, and interpret graphs of linear and quadratic graphs.	96, 98, 160
Recognise, sketch, and interpret cubic functions x^3 and the reciprocal function 1/x (and asymptotes).	161
Plot and interpret real life graphs the trends they show.	153
Chapter 18 Graphs 2	
Recognise, sketch, and interpret cubic functions x^3 and the reciprocal function 1/x (and asymptotes).	161
Recognise, sketch and interpret exponential graphs (eg 2^x)	194
Recognise, sketch and interpret the trigonometric graphs - sin x, cos x and tan x.	195a,b,
Recognise and sketch transformations of graphs e.g. f(x)+a, af(x), -f(x)	196a,b
Find the gradient of a curve at a point by drawing a tangent to the curve and finding the gradient of that. Find the area underneath a curve by splitting it up into shapes like trapezia and triangles.	216a,b
Understand and use the equation of a circle. Find the equations of tangents to circles.	197
Chapter 16 Grouped and bivariate data	
Draw and interpret frequency diagrams inc. pictograms, bar charts, vertical line charts	15, 16, 64, 65a,b
Draw histograms for grouped continuous data.	205
Find the estimated mean, modal class, and the class containing the median for data in a grouped frequency table. Compare data from two tables.	62, 130a,b
Draw cumulative frequency graphs and box plots. Use these to compare two data sets.	186, 187
Scatter diagrams and correlation. Make predictions from scatter diagrams using the line of best fit and understand when data is interpolated (reliable) and when it is extrapolated (unreliable). Identify outliers.	129
Interpret time series graph and give the trend of the graph.	153

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Year 11 Spring	
Chapter 15 Working in 3D	
Properties of solids, edges, faces, vertices.	43
Drawing nets of 3D shapes and drawing 3D shapes in plan and elevation. Sketching the 3D shape from its plan and elevation.	44, 51
Finding the surface area of cuboids and prisms inc. cylinders.	114a,b,
Finding the volume of cuboids and prisms inc. cylinders.	115, 119
Finding the volume and surface area of a sphere.	169
Finding the volume and surface area of a pyramid.	170
Finding the volume and surface area of a cone.	171
Work out the volume and surface area of composite solids, inc. a frustum of a cone.	172
Areas and volumes in similar shapes.	201
Y11 Assessment Week	
Chapter 20 Combined Events.	
To read set data from Venn diagrams or put set data into Venn diagrams. Understand the keywords intersect, union, the universal set and complement.	127a,b
Solve probability problems based on Venn diagrams.	185
Put the outcomes of events into a possibility space diagram. Use the diagram to help calculate the probability of events happening.	126
Record data in a frequency tree	57
Simple tree diagrams to work out the probabilities of events happening.	151
Tree diagrams - probability of independent and dependent events occurring (without replacement questions).	175
And and Or probability questions	204
Conditional probability (Probability of A given B)	-
Capture-recapture (sampling methods)	152 (from 3:34)
Chapter 21 Sequences	
To understand sequences and terms. To generate a sequence from a term-to-term rule. Find the rule.	37
To generate a sequence from the nth term (position to term rule).	102
To find the nth term rule of a linear sequence. Understand what a linear sequence is.	103
To understand special sequences like triangle numbers and the Fibonacci sequence.	104, 141
To understand the keywords, arithmetic and geometric series.	163
Find the nth term rule for a quadratic sequence.	213