TeeJay Publishers

SQA - National 5

National 5 Course Planner Using TeeJay's Books CfE4+ and N5

This *Course Planner* for National 5, is based on TeeJay's New CfE4+ and N5, comes in two parts :-

Part A - Each Outcome is listed in order, directly from the SQA site, with a reference as to how our CfE4+ and N5 books cover the entire contents as listed in the official documents, including the new topics - Vectors, Completion of the Square, The Discriminant and 3D Pythagoras work. This Part takes the learner through the course following the Units :- Expressions & Formulae, Relationships and Applications. **Model 1***

Schools wishing to follow **Model 1*** in the National 5 Guidelines, as detailed, **in order**, i.e. ***Expressions and Formulae***, followed by ***Relationships***, followed by ***Applications***, should refer to **Part A** of this course planner below.

Part B - The Book Chapters are listed **in order** from our CfE4+ and N5 in a more realistic way, with references to the official SQA list of Outcomes. (***A more practical course planner***). **Model 2***

Schools may wish instead to follow **Model 2*** of the SQA National 5 Guidelines, which offers a broader approach, by **integrating** all 3 concepts, ***Expressions and Formulae***, ***Relationships*** and ***Applications*** into the ongoing teaching and delivery of the National 5 course.

Models 1/2* - See Pages 9-10 of the SQA's National 5 Mathematics Course Support Notes, by visiting their web page :-

http://www.sqa.org.uk/files_ccc/CfE_CourseUnitSupportNotes_N5_Mathematics_Mathematics.pdf.

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SQA - National 5

National 5 Course Planner - Following Outcome Order

This *Course Planner* for National 5, is based on TeeJay's CfE4+ and N5 books.

Part A

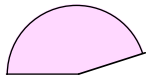
Schools wishing to follow Model 1* in the National 5 Guidelines, as detailed, **in order**, i.e. ***Expressions and Formulae***, followed by ***Relationships***, followed by ***Applications***, should refer to **Part A** of this course planner.

Model 1* - See Page 9 of the SQA's National 5 Mathematics Course Support Notes, by visiting their web page :-

http://www.sqa.org.uk/files_ccc/CfE_CourseUnitSupportNotes_N5_Mathematics_Mathematics.pdf.

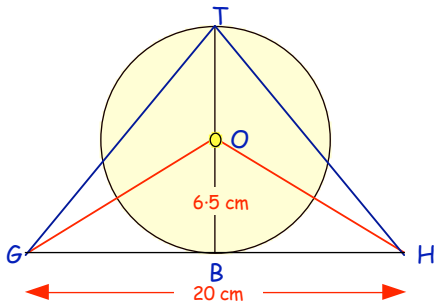
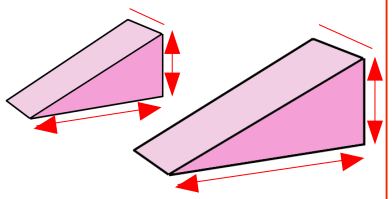
Outcome	Unit Description + Added Value	CfE Book 4+	National 5 Bk N5	Comments/Methodology/Other Resources	✓
Applying numerical skills to simplify surds/expressions using laws of indices					
E1.1 Working with surds.	Simplification. Rationalising denominators. $\sqrt{32} = 4\sqrt{2}$ $\quad \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$		*Ch 17 Page 170* *Ch 17 Page 171-172*		☐ ☐
E1.2 Simplifying expressions using the laws of indices.	Multiplication and division using positive and negative indices including fractions. Calculations using scientific notation. Simplification of nested indices. $(2{\cdot}5 \times 10^3) \times (6{\cdot}8 \times 10^{12})$, $(am)^n = a^{mn}$,	*Ch 10 pages 66-70*	*Ch 17 Pages 173-177* *Ch 17 Pages 173-177*		☐ ☐ ☐
Applying numerical skills to manipulate expressions					
E2.1 Working with algebraic expressions with brackets.	$a(bx + c) + d(ex + f)$, $(ax + b)(cx + d)$ $ax(bx + c)$, $(ax + b)(cx^2 + dx + e)$ where a, b, c, d, e, f are integers. $(3x + 1)(2x - 5)$.	*Ch 5 pages 31-33*	*Ch 1 page 13* *Ch 1 pages 14-18*		☐ ☐ ☐
E2.2 Factorising an algebraic expression.	Common factor. Difference of squares $x^2 - a^2$. Common factor with difference of squares $px^2 - q^2$. Trinomials with unitary x^2 coefficient. Trinomials with non-unit x^2 coefficient. $ax^3 + x^2$, $x^2 - 16$, $x^2 - 4x + 3$	*Ch 5 pages 33-34*	*Ch 7 page 65* *Ch 7 page 66* *Ch 7 page 67-68* *Ch 7 page 68-69*		☐ ☐ ☐ ☐

Outcome	Unit Description + Added Value	CfE Book 4+	National 5 Bk N5	Comments/Methodology/Other Resources	√
E2.3 Completing the square in a quadratic expression with unitary x^2 coefficient.	Complete the square. Parabolic graph, turning points, equation of axis of symmetry, max/min values. $x^2 + 4x - 1 = (x + 2)^2 - 5$		*Ch 19 page 187* *Ch 19 pages 188-189*		☐ ☐
Applying algebraic skills to algebraic fractions					
E3.1 Reducing an algebraic fraction to its simplest form.	a/b where a, b are of the form $(x + p)^n$ or $(x + p)(x + q)$. $\frac{x^2-6x+5}{x^2-1}$		*Ch 9 pages 90-92*		☐
E3.2 Applying the four operations to algebraic fractions.	$a/b + c/d$, $a/b - c/d$, $a/b \times c/d$ or $a/b \div c/d$, a, b, c, d are simple constants or variables. $\frac{8k}{6} \div \frac{4}{3k}$		*Ch 9 pages 92-95*		☐ ☐
Applying geometric skills linked to the use of formulae					
E4.1 Determining the gradient of a straight line given two points.	$m = \frac{y_2-y_1}{x_2-x_1}$ Gradients from coordinate diagrams. Zero & Negative gradients. Lines in everyday use Link to equations of lines. Link to lines of best fit. Discuss rates of change, steepness, etc Parallel lines have same gradient.	 *Ch 8 - All* *Ch 8 - All* *Ch 8 - All* *Ch 8 - throughout*	*Ch 6 pages 58-59* *Ch 6 pages 50-54* *Ch 6 pages 52-54* *Ch 6 pages 55-57* *Ch 18 pages 179-182* *Ch 6 throughout*		☐ ☐ ☐ ☐ ☐ ☐

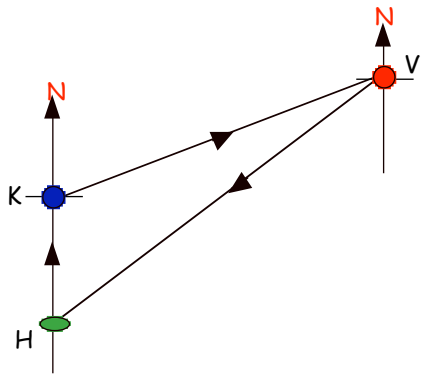
Outcome	Unit Description + Added Value	CfE Book 4+	National 5 Bk N5	Comments/Methodology/Other Resources	✓
E4.2 Calculating the length of an arc or the area of a sector of a circle.	Find circumference or area of circle and use angle at centre to calculate arc length or sector area, Calculate angle at centre given arc length or sector area, 	*Ch 11 pages 73-79*	*Ch 13 pages 126-128* *Ch 13 pages 129-130*		☐ ☐ ☐
E4.3 Calculating the volume of a standard solid,	Calculating the volume of a sphere, cone and pyramid. $V = \frac{4}{3}\pi r^3$ *for a spher*	*Ch 16 pages 121-130*			☐
E4.4 Rounding to a given number of significant figures,	*12·0 has 3 sig. figs.* *25 827 becomes 30 000 to 1 sig. fig.*	*Ch 1 pages 6-7*			☐
E5.1 Interpreting a situation where mathematics can be used and identifying a strategy. E5.2 Explaining a solution and relating it to context.			*Can be attached to any Assessment Standard in the other outcomes to require analysis of situation.* *Can be attached to other Assessment Standard to require explanation of the solution given.*		

Outcome	Unit Description + Added Value	CfE Book 4+	National 5 Bk N5	Comments/Methodology/Other Resources	
Applying algebraic skills to linear equations					
R1.1 Determining the equation of a straight line, given the gradient.	Use the formula $y - b = m(x - a)$ or equivalent to find the equation of a straight line, given two points or one point and the gradient of the line.		*Ch 6 pages 58-60*		☐
	Identify gradient and y-intercept values from $y = mx + c$.		*Ch 6 pages 61*		☐
	Identify gradient and y-intercept from various forms of a line.	*Ch 8 page 51-53*	*Ch 6 pages 61*		☐ ☐
	Use functional notation $f(x)$. $y = 2x + 3$ $y - 4 = 3(x - 1)$		*Ch 12 pages 116-118*		☐
R1.2 Working with linear equations and inequations.	$Ax + By + C = 0$ $2x + 1 > 5$ Coefficients are a member of Z.. Solutions are a member of Q.	*Ch 9 pages 55-60*	*Ch 1 page 18*		☐ ☐
R1.3 Working with simultaneous equations.	$3x + 5y = 13$ $4x - y = 2$ Graphical solution.		*Ch 4 pages 35-36*		☐
	Algebraic solution.		*Ch 4 pages 37-39*		☐
	Construct from text.		*Ch 4 pages 40-42*		☐ ☐

Outcome	Unit Description + Added Value	CfE Book 4+	National 5 Bk N5	Comments/Methodology/Other Resources	
R1.4 Changing the subject of a formula.	Linear equation. Equation involving a simple square or square root. $s = ut + \frac{1}{2}at^2$ to a, $E = \frac{1}{2}mv^2$ to v.		*Ch 10 pages 99-100* *Ch 10 pages 101-102*		☐ ☐
Applying algebraic skills to graphs of quadratic relationships					
R2.1 Recognise and determine the equations of quadratics from their graphs.	Equations of the form $y = kx^2$ and $y = (x + p)^2 + q$; p, q, k are Integers. $y = (x - 2)^2 + 1$.		*Ch 19 pages 188-191*		☐
R2.2 Sketching a quadratic function.	Equations of the form $y = (x - d)(x - e)$ and $y = (x + p)^2 + q$. $y = (x - 2)^2 + 1$ is a parabola with min TP		*Ch 14 pages 132-133* *Ch 14 pages 138* *Ch 19 pages 188-191*		☐
R2.3 Identifying features of a quadratic function.	Equations of the form $y = (x - d)(x - e)$ and $y = \pm(x + p)^2 + q$. $y = (x - 2)^2 + 1$ is a parabola with min T.P. (2, 1) and $x = 2$ as axis of symm.		*Ch 19 pages 188-191*		☐ ☐
Applying algebraic skills to quadratic equations					
R3.1 Working with quadratic equations.	Solve Graphically. Solve by Factorising. Solve using Roots. Solve using Quadratic formula. Study the Discriminant. Solve $(x + 3)(x - 6) = 0$, $2x^2 + 3x - 5 = 0$		*Ch 14 pages 132-133* *Ch 14 pages 134-137* *Ch 19 pages 192-193* *Ch 19 page 194*		☐ ☐ ☐ ☐

Outcome	Unit Description + Added Value	CfE Book 4+	National 5 Bk N5	Comments/Methodology/Other Resources	√
Applying geometric skills to lengths, angles and similarity					
R4.1 Applying the Pythagoras' Theorem.	Using Theorem of Pythagoras. Use Converse of Pythagoras Theorem. Use Pythagoras in 3D situations.	*Ch 13 pages 91-99*	*Ch 5 page 44-45* *Ch 5 page 46* *Ch 5 page 47-48*		☐ ☐ ☐ ☐
R4.2 Applying properties of shapes.	Quadrilaterals/triangles/polygons/circles. Circumference and Area of a circle. Angle Properties. Relationship in a circle between the centre, chord & perpendicular bisector. 	*Ch 2 page 13* *Ch 11 pages 73-79* *Ch 2 pages 11-13* *Ch 18 pages 139-145*			☐ ☐ ☐ ☐
R4.3 Using similarity.	Interrelationship of scale — length area volume. 	*Ch 20 pages 166-172* *Ch 20 pages 173-174* *Ch 20 pages 175-176*			☐ ☐ ☐

Outcome	Unit Description + Added Value	CfE Book 4+	National 5 Bk N5	Comments/Methodology/Other Resources	√
Applying trigonometric skills to graphs and identities					
R5.1 Working with the graphs of trigonometric functions.	*Graph of y = sinx°, y = cosx°, y = tanx°* Basic graphs. Scaling amplitude. Vertical translation. Multiple angle and Phase angle.		*Ch 16 pages 156-168 ALL*		☐
R5.2 Working with trigonometric relationships in degrees.	*find sin 315°* *solve 2cosx° + 2 = 3* Sin, Cos and Tan of angles 0-360°. Period. Related angles . Solving basic equations. Identities $\cos^2 x + \sin^2 x = 1$ and $\tan x = \sin x / \cos x$.		*Ch 20 pages 196-200 ALL* *Ch 20 pages 201-202*		☐ ☐ ☐ ☐ ☐
R6.1 Interpreting a situation where mathematics can be used and identifying a strategy.			*Can be attached to any Assessment Standard in the other outcomes to require analysis of situation.*		
R6.2 Explaining a solution and relating it to context.			*Can be attached to other Assessment Standard to require explanation of the solution given.*		

Outcome	Unit Description + Added Value	CfE Book 4+	National 5 Bk N5	Comments/Methodology/Other Resources	
Applying trignometric skills to triangles which do not have a right angle					
A1.1 Calculating the area of a triangle using trigonometry.	Area = $\frac{1}{2}absinC$		*Ch 8 pages 73-75*		☐
A1.2 Using the sine and cosine rules to find a side or angle.	$a^2 = b^2 + c^2 - 2bccos\ A$				
	Sine rule for side.		*Ch 8 pages 76-78*		☐
	Sine rule for angle.		*Ch 8 pages 79-80*		☐
	Cosine rule for side.		*Ch 8 pages 81-83*		☐
	Cosine rule for angle.		*Ch 8 pages 83-84*		☐
	Which rule ? (+ with SohCahToa).		*Ch 8 pages 85-88*		☐
A1.3 Using bearings with trigonometry.					
	To find a distance or direction.		*Ch 8 pages 85-88*		☐

Outcome	Unit Description + Added Value	CfE Book 4+	National 5 Bk N5	Comments/Methodology/Other Resources	
Applying geometric skills to vectors					
A2.1 Working with 2D vectors.	Adding or subtracting two-dimensional vectors using directed line segments.		*Ch 15 pages 141-144*		
A2.2 Working with 3D co-ordinates.	Interpreting three-dimensional coordinates or directed line segments which are given in diagrams. Using skeleton diagrams.		*Ch 15 pages 149-151*		
A2.3 Using vector components.	Adding or subtracting two- or three-dimensional vectors using components. Magnitude of a Vector		*Ch 15 pages 144-145* *Ch 15 pages 146-148*		
Applying numerical skills to fractions and percentages					
A3.1 Working with percentages.	*My car is now worth only 70% of its value when I bought it. What did I pay for it ?* Use reverse percentages to calculate an original quantity. Appreciation - including compound interest and depreciation.		*Ch 2 page 27* *Ch 2 pages 20-26*		☐ ☐
A3.2 Working with fractions.	$4\frac{1}{4} - 1\frac{4}{5}$ $2\frac{1}{2} \times \frac{1}{8}$ Operations and combinations of operations of vulgar fractions including mixed numbers.	*Ch 21 page 178-182*	*Ch 3 pages 29-31*		☐ ☐

Outcome	Unit Description + Added Value	CfE Book 4+	National 5 Bk N5	Comments/Methodology/Other Resources	
Applying statistical skills to analysing data					
A4.1 Comparing data sets using statistics.	*Calculate mean & standard deviation of one set of data and make comparisons with others.* Compare data sets using calculated/ determined:- • quartiles and interquartile range • standard deviation.	*Ch 22 page 188-193*	*Ch 11 page 104* *Ch 11 page 111-114* *Ch 11 page 105-114*		☐ ☐ ☐
A4.2 Forming a linear model from a given set of data.	*From a set of data, pot points, draw a scattergraph and insert line of best fit.* Determine the equation of a best-fitting straight line on a scattergraph and use it to estimate a *y* given *x*.		*Ch 18 page 179-182*		☐
A5.1 Interpreting a situation where mathematics can be used and identifying a strategy.				*Can be attached to any Assessment Standard in the other outcomes to require analysis of situation.*	
A5.2 Explaining a solution and/or relating it to context.				*Can be attached to other Assessment Standard to require explanation of the solution given.*	

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SQA - National 5

National 5 Course Planner - Following Book Order

This *Course Planner* for National 5, is based on TeeJay's Int-2-Credit Books 1 & 2.

Part B

Schools may wish instead to follow the more practical Model 2* of the SQA National 5 Guidelines, which offers a broader approach, by **integrating** all 3 concepts, ***Expressions and Formulae***, ***Relationships*** and ***Applications*** into the ongoing teaching and delivery of the national 5 course.

Please note that this course planner shows how the two books, as well as preparing students for a national 5 Course, cover along the way most topics associated with CfE Level 4. Those topics not mentioned in this Course planner, such as Financial Maths, Coordinate work including geometrical transformations etc were covered extensively in TeeJays CfE Books 3a and 3b.

Model 2* - See Page 10 of the SQA's National 5 Mathematics Course Support Notes, by visiting their web page :-

http://www.sqa.org.uk/files_ccc/CfE_CourseUnitSupportNotes_N5_Mathematics_Mathematics.pdf.

Ch	Heading	Ex	Topics	Pages	Outcome	Comments/Methodology/Assessments
0.	Revision	0	Revision of CfE Level 3	1 - 5	CfE Level 3	Possibly assess usingTeeJay's Level 3 Diag Assessment
1.	Number work (Revision)	1.1	Round to significant figures	6	MNU 3-01a/E4·4	
		1.2	Estimate using significant figures	7	MNU 3-01a/E4·4	
		1.3	BODMAS (*BOMDAS*)	8	MNU 3-03b/4-03b	
		1.4	Integers - addition, subtraction, multiplication & division	9	MNU 3-04a	
			Remember Remember	10		
2.	Angle Properties (Revision)	2·1	All basic angle revision work including parallel lines	11-12	MNU 3-17a	
		2·2	Angles in quadrilaterals	13	MNU 3-17a	
			Remember Remember	14		
3.	Percentages, /Fractions and Decimals	3·1	Percentages without a calculator including mental work	15	MNU 4-07a	
		3·2	Percentages using a calculator	16	MNU 4-07a	
		3·3	Link fractions <--> decimals <--> percentages	17	MNU 4-07a	
			Remember Remember	18		
	Home Exercise 1		Revision of Chapters 1 - 3	19		
	Non-Calculator		Non-Calculator Exercise 1	20		
4.	Money Matters	4·1	Wages and salaries - overtime etc.	21 - 22	MNU 4-09b/c	
		4·2	Gross pay, deductions and net pay	23	MNU 4-09b/c	
		4·3	Income tax	24	MNU 4-09b/c	
		4·4	Valued added tax	25 - 26	MNU 4-09b/c	
		4·5	Hire purchase	27	MNU 4-09b/c	
		4·6	Insurance	28	MNU 4-09b/c	
		4·7	Foreign exchange	29	MNU 4-09b/c	
			Remember Remember	30		
5.	Algebraic Operations	5·1	Multiply algebraic expressions like $2x \times 3x$, $5ab \times 3ac$ etc	31	MTH 4-14a	
		5·2	Multiply out brackets and tidy :- $3(2x - 1) - 2(4x + 3)$ etc	32 - 33	MTH 4-14a/E2·1	
		5·3	Factorise algebraic expressions - common factor	33 - 34	MTH 4-14b/E2·2	
			Remember Remember	34		
6.	Rotational Symmetry	6·1	Revise line symmetry	35 - 36	MTH 4-19a	
		6·2	Rotational symmetry - half turn - order of rotational symmetry	36 - 37	MTH 4-19a	
		6·3	Translational symmetry and tiling	38	MTH 4-19a	
			Remember Remember	39		

Ch	Heading	Ex	Topics	Pages	Outcome	Comments/Methodology/Assessments
	Home Exercise 2		Revision of Chapters 4 - 6	40		
	Non-Calculator		Non-Calculator Exercise 2	41		
7.	Tolerance	7·1	The idea of tolerance	42 - 43	MNU 4-01a	
		7·2	Tolerance notation	43 - 44	MNU 4-01a	
			Remember Remember	45		
8.	Gradients & Lines Linear Relationships	8·1	Gradients of hills, slopes, ladders etc. and comparisons	46 - 47	MTH 4-13b	
		8·2	Determine the gradient of a line in coordinate diagram	48 - 49	MTH 4-13b/E4·1	
		8·3	Sketch lines of the form $y = mx$ and $y = mx + c$ from a table	50	MTH 4-13c/d	
		8·4	The line $y = mx + c$ - its gradient and its y-intercept	51 - 53	MTH 4-13c/d/R1·1	
			Remember Remember	53-54		
9.	Equations & Inequalities	9·1	All equations revised up to equations with brackets	55 - 56	MTH 4-15a	
		9·2	Equations involving fractions	57	MTH 4-15a/R1·2	
		9·3	Harder equations involving fractions	58	MTH 4-15a/R1·2	
		9·4	Inequalities, including division of both sides by a negative	59 - 60	MTH 4-15a/R1·2	
			Remember Remember	61		
	Home Exercise 3		Revision of Chapters 7 - 9	62		
	Non-Calculator		Non-Calculator Exercise 3	63		
10.	Powers, Roots and Scientific Notation	10·1	Squares, roots and powers (Indices)	64	MTH 4-06a	
		10·2	Square (and cube) roots - (*Extension*)	65	MTH 4-06a	
		10·3	Large numbers into and out of standard form	66 - 67	MTH 4-06b/E1·2	
		10·4	Small numbers in and out of standard form	68 - 69	MTH 4-06b	
		10·5	Scientific notation using a calculator - the Exp or EE buttons	70 - 71	MTH 4-06b	
			Remember Remember	72		
11.	The Circle 1	11·1	The circumference of a circle	73 - 74	MTH 4-16b	
		11·2	Calculating the diameter from the circumference	75 - 76	MTH 4-16b	
		11·3	The area of a circle	76 - 77	MTH 4-16b	
		11·4	Calculate the radius, knowing the area.	78	MTH 4-16b	
		11·5	Mixed problems	79	MTH 4-16b	
			Remember Remember	80		

Ch	Heading	Ex	Topics	Pages	Outcome	Comments/Methodology/Assessments
12.	Coordinates and Transformations	12·1	Plotting/reading points in all 4 quadrants of coord diagram	81 - 82	MTH 4-18a	
		12·2	Reflection, rotation, translation and dilation (dilatation)	83 - 86	MTH 4-18b	
		12·3	Mixed exercise involving 2 or more transformations	86	MTH 4-18b	
			Remember Remember	87		
	Home Exercise 4		Revision of Chapters 10 - 12	88		
	Cumulative Revision		Revision of Chapters 1 - 12	89		
	Non-Calculator		Non-Calculator Exercise 4	90		
13.	Pythagoras' Theorem	13·1	Find the hypotenuse of of a right angled triangle	91 - 93	MTH 4-16a	
		13·2	Problems solved using Pythagoras' Theorem	94 - 95	MTH 4-16a	
		13·3	Finding the smaller side in a right angled triangle	96	MTH 4-16a	
		13·4	Mixed problems using Pythagoras' Theorem	97 - 98	MTH 4-16a/R4·1	
		13·5	Distance between 2 Cartesian points	99	MTH 4-16a/R4·1	
			Remember Remember	100		
14.	Time/Distance/Speed	14·1	The formula $D = S \times T$	101	MNU 4-10b	
		14·2	The formulae $S = D \div T$ and $T = D \div S$	102	MNU 4-10b	
		14·3	Time-distance-speed problems	103	MNU 4-10b	
		14·4	Converting hours and minutes to hours	104 - 105	MNU 4-10b	
		14·5	Converting back from decimal times to hours and minutes	105 - 106	MNU 4-10b	
		14·6	Time-distance-speed graphs	107 - 109	MNU 4-10b	
			Remember Remember	110		
15.	Proportion	15·1	Proportional division (sharing)	111	MNU 4-08a	
		15·2	Proportion - basic unitary proportion	112	MNU 4-08a	
		15·3	Direct proportion - knowing the cost of x, find the cost of y	113	MNU 4-08a	
		15·4	The linear graph of direct proportion	114 - 115	MNU 4-08a	
		15·5	Indirect (inverse) proportion	116	MNU 4-08a	
			Remember Remember	117		
	Home Exercise 5		Revision of Chapters 13 - 15	118		
	Cumulative Revision		Revision of Chapters 1 - 15	119		
	Non-Calculator		Non-Calculator Exercise 5	120		

Ch	Heading	Ex	Topics	Pages	Outcome	Comments/Methodology/Assessments
16.	3D Shapes - Surface Areas and Volumes	16·1	Revise areas of triangles and quadrilaterals	121	MNU 3-11a	
		16·2	Volume of cubes and cuboids, capacity and surface areas	122 - 123	MTH 3-11b/4-11b	
		16·3	Volumes of prisms	124 - 125	MTH 4-11c	
		16·4	Volumes of cylinders	125 - 126	MTH 4-11c	
		16·5	Volumes of pyramids (and the cone)	127 - 128	MTH 4-11c/E4·3	
		16·6	Curved surface areas of cylinders	129	MTH 4-11c	
		16·7	Volumes of spheres, hemi-spheres and composite shapes	130	MTH 4-11c	
			Remember Remember	131		
17.	Patterns	17·1	Recognise linear patterns of form $y = mx$	132	MTH 4-13a	
		17·2	Recognise linear patterns of form $y = mx + c$	133 - 134	MTH 4-13a	
		17·3	Non-linear patterns	135	MTH 4-13a	
		17·4	Investigations and harder patterns (*Part-Extension*)	136-137	MTH 4-13a	
			Remember Remember	138		
18.	The Circle 2	18·1	Angles in circles - isosceles triangles	139 - 140	MTH 4-17a/R4·2	
		18·2	Angles in a semi-circle	141 - 142	MTH 4-17a/R4·2	
		18·3	Tangents to circles	143 - 144	MTH 4-17a/R4·2	
		18·4	Tangent kites	145	MTH 4-17a/R4·2	
			Remember Remember	146		
	Home Exercise 6		Revision of Chapters 16 - 18	147		
	Cumulative Revision		Revision of Chapters 1 - 18	148		
	Non-Calculator		Non-Calculator Exercise 6	149		
19.	Basic Right Angled Triangle Trigonometry	19·1	Introduction to tangents	150 - 151	MTH 4-16a	
		19·2	Tangents and calculating sides	151 - 152	MTH 4-16a	
		19·3	Tangents and calculating angles	153 - 154	MTH 4-16a	
		19·4	The sine ratio	155 - 157	MTH 4-16a	
		19·5	The cosine ratio	158 - 159	MTH 4-16a	
		19·6	Harder trigonometry questions	160 - 161	MTH 4-16a	
		19·7	Use of SOHCAHTOA	162 - 164	MTH 4-16a	
			Remember Remember	165		
20.	Similar Figures	20·1	Similar figures	166 - 168	MTH 4-17b/R4·3	
		20·2	Similar triangles	169 - 170	MTH 4-17b/R4·3	
		20·3	Similar triangles and parallel lines	171 - 172	MTH 4-17b/R4·3	
		20·4	Ratios of areas of similar figures	173 - 174	MTH 4-17b/R4·3	
		20·5	Ratios of volumes of similar figures (*Extension*)	175 - 176	R4·3	
			Remember Remember	177		

Ch	Heading	Ex	Topics	Pages	Outcome	Comments/Methodology/Assessments
21.	Fractions	21·1	Fractions- simplifying and equivalent fractions	178 - 179	MTH 4-07b	
		21·2	Add and subtract basic fractions	179 - 180	MTH 4-07b/A3·2	
		21·3	Add and subtract fractions with different denominators	181 - 182	MTH 4-07b/A3·2	
		21·4	Multiply fractions	183	MTH 4-07b/A3·2	
			Remember Remember	184		
	Home Exercise 7		Revision of Chapters 19 - 21	185		
	Cumulative Revision		Revision of Chapters 1 - 21	186		
	Non-Calculator		Non-Calculator Exercise 7	187		
22.	Use Simple Statistics	22·1	Mean, median, mode and range of data set	188 - 190	MTH 4-20b	
		22·2	Mean, median, mode and range from frequency table	191 - 192	MTH 4-20b	
		22·3	Cumulative frequency - an aid to finding the median	193	MTH 4-20b	
			Remember Remember	194		
23.	Statistical Graphs Charts & Tables	23·1	Interpret composite bar and line graphs	195	MTH 4-21a	
		23·2	Introduction to pie-charts	196	MTH 4-21a	
		23·3	Harder pie-charts	197 - 198	MTH 4-21a	
			Remember Remember	199		
24.	Probability Charts & Tables	24·1	Revision of Basic Probability (Oral)	200	MNU 3-22a	
		24·2	Calculating probability and predicting events	200 - 202	MNU 4-22a	
			Remember Remember	202		
	Home Exercise 8		Revision of Chapters 22 - 24	203		
25.	Revision	25·1	Revision of all CfE Level 4	204 - 210	CfE Level 4	
	Answers		Answers to all exercises	211 - 221		

Ch	Heading	Ex	Topics	Pages	Outcome	Comments/Methodology/Assessments
0.	Revision	0	Revision of CfE Level 4	1 - 12	CfE Level 4	
1.	Algebraic Operations	1.1	Revise multiplying out brackets and tidy up $3(2x-1)-2(4x+3)$	13	MTH 4-14a	
		1.2	Multiply out double brackets and squaring brackets	14 - 16	E2·1	
		1.3	Tidy up $(2x+3)(5x-1)-(2x+1)^2$ and $(x+2)^3$	17	E2·1	
		1.4	Equations with brackets	18	E2·1	
			Remember Remember	19		
2.	Further Calculations Involving Percentages	2.1	Revision of non-calculator percentages, including mental	20 - 21	MNU 4-07a	
		2.2	Revision of %age increase/decrease and express A as percentage of B	22	MNU 4-07a	
		2.3	Percentage profit and loss	23	A3·1	
		2.4	Compound interest	24 - 25	A3·1	
		2.5	Depreciation and appreciation	25 - 26	A3·1	
		2.6	Percentages - working backwards	27	A3·1	
			Remember Remember	28		
3.	Fractions	3.1	Revision of all fraction work up to multiplication	29 - 30	MTH 4-07b	
		3.2	Divide fractions	31	A3·2	
			Remember Remember	32		
	Home Exercise 1		Revision of Chapters 1 - 3	33		
	Non-Calculator		Non-Calculator Exercise 1	34		
4.	Simultaneous Equations Linear Equations	4.1	Revision of sketching lines	35	R1·3	
		4.2	Solve simultaneous equations graphically	36	R1·3	
		4.3	Simultaneous equations - solution by elimination - basic	37	R1·3	
		4.4	Simultaneous equations - solution by elimination - harder	38 - 39	R1·3	
		4.5	Simultaneous equations in two variables + associated problems	40 - 42	R1·3	
			Remember Remember	43		
5.	Pythagoras' Theorem (Further work)	5.1	Revision of all Pythagoras work	44 - 45	MTH 4-16a	
		5.2	Converse of Pythagoras' Theorem	46	R4·1	
		5.3	Pythagoras work in 3-dimensions	47 - 48	R4·1	
			Remember Remember	49		

Ch	Heading	Ex	Topics	Pages	Outcome	Comments/Methodology/Assessments
6.	Linear Relationships	6.1	Gradients Revision	50 - 51		
		6.2	Revision of Line work including $y = mx + c$ and $x = h$ and $y = k$	52 - 53	MTH 4-13c/d	
		6.3	Find equation of line through $A(x_1,y_1)$ and $B(x_2,y_2)$	54	R1·1	
		6.4	Equations of the form $P = mt + c$, lines in everyday use	55 - 57	R1·1	
		6.5	Gradient - a more mathematical formula	58 - 59	E4·1/1·1	
		6.6	Equation of a line - a more mathematical approach	59 - 60	R1·1	
		6.7	The General Equation of a line $Ax + By + C = 0$	61	R1·1	
			Remember Remember	62		
	Home Exercise 2		Revision of Chapters 4 - 6	63		
	Non-Calculator		Non-Calculator Exercise 2	64		
7.	Factorising	7.1	Revision of factorising by taking out a common factor	65	MTH 4-14b	
		7.2	Difference of two squares, including $6x^2 - 24$ and $x^4 - 81$ etc	66	E2·2	
		7.3	Trinomial expressions	67 - 68	E2·2	
		7.4	Miscellaneous expressions	68 - 69	E2·2	
			Remember Remember	69		
8.	Trigonometric Formulae	8.1	Revision of SOHCAHTOA	70 - 72	MTH 4-16a	
		8.2	Area of a triangle - using trigonometry	73 - 75	A1·1	
		8.3	Sine rule - calculating a side	76 - 78	A1·2	
		8.4	Sine rule - calculating an angle	79 - 80	A1·2	
		8.5	Cosine rule - calculating a side	81 - 83	A1·2	
		8.6	Cosine rule - calculating an angle	83 - 84	A1·2	
		8.7	Mixed problems - sine rule, cosine rules with SOHCAHTOA	85 - 86	A1·2	
		8.8	Further mixed problems	87 - 88	A1·3	
			Remember Remember	89		
9.	Algebraic Fractions	9.1	Operations on algebraic fractions - simplifying	90 - 91	E3·1	
		9.2	Operations on algebraic fractions - factorisation	91 - 92	E3·2	
		9.3	Operations on algebraic fractions - add & subtract	92 - 94	R3·2/E3·2	
		9.4	Operations on algebraic fractions - multiply & divide	94 - 95	R3·2/E3·2	
			Remember Remember	96		
	Home Exercise 3		Revision of Chapters 7 - 9	97		
	Non-Calculator		Non-Calculator Exercise 3	98		

Ch	Heading	Ex	Topics	Pages	Outcome	Comments/Methodology/Assessments
10.	Changing the Subject	10·1	Change the subject of an expression - basic	99 - 100	R1·4	
		10·2	Change the subject of an expression - harder	101 - 102	R1·4	
			Remember Remember	103		
11.	Statistics	11.1	Revision of mean, median, mode and range	104	MTH 4-20b	
		11.2	Quartiles	105 - 107	A4·1	
		11.3	Semi-interquartile range	108	A4·1	
		11.4	Box plots	109 - 110	A4·1	
		11.5	Standard deviation	111 - 114	A4·1	
			Remember Remember	115		
12.	Functions & Graphs	12.1	Number machines and the function notation $f(x)$	116 - 118	R1·1	
		12.2	The quadratic function	119 - 121	R2·2	
			Remember Remember	122		
	Home Exercise 4		Revision of Chapters 10 - 12	123		
			Revision of Chapters 1 - 12	124		
	Non-Calculator		Non-Calculator Exercise 4	125		
13.	Circles - Arcs/Sectors	13.1	Arc lengths	126	E4·2	
		13.2	Areas of sectors	127	E4·2	
		13.3	Mixed examples	128	E4·2	
		13.4	Angles at centre, given arc	129	R4·2/E4·2	
		13.5	Angles at centre, given area	130	R4·2/E4·2	
			Remember Remember	131		
14.	Quadratic Function 1 Drawing its Graph	14.1	Sketching parabolas associated with quadratic function	132	R3·1	
		14.2	Solve quadratic equations graphically - find roots	133	R3·1	
		14.3	Revise factorisation	134	E3·2	
		14.4	Solve quadratic equations by factorising	135 - 137	R3·1	
		14.5	Sketch parabolas by factorising and using symmetry	138	R3·1	
		14.6	Intersection of lines and parabolas by factorising	139	R3·1	
			Remember Remember	140		

Ch	Heading	Ex	Topics	Pages	Outcome	Comments/Methodology/Assessments
15.	Vectors	15.1	What is a vector ? - simple adding and subtracting diagrammatically	141 - 144	A2·1	
		15.2	Vectors in 2 dimensions	144 - 145	A2·1	
		15.3	Position vectors	146	A2·2	
		15.4	Magnitude of a vector	147	A2·3	
		15.5	Mixed Exercise	148	A2·3	
		15.6	Alternative vector journeys	149	A2·3	
		15.7	Vectors in 3 dimensions	150 - 151	A2·2/2·3	
			Remember Remember	152		
	Home Exercise 5		Revision of Chapters 13 - 15	153		
			Revision of Chapters 1 - 15	154		
	Non-Calculator		Non-Calculator Exercise 5	155		
16.	Trigonometric Graphs	16.1	Recognise/draw basic sine graphs (period etc)	156 - 157	R5·1	
		16.2	Recognise/draw basic cosine graphs (period etc)	158 - 159	R5·1	
		16.3	Recognise/draw basic tangent graphs (period etc)	160	R5·1	
		16.4	Trig functions of the form $y = a\sin x^\circ$ and $y = a\cos x^\circ$	161 - 162	R5·1	
		16.5	Trig functions of the form $y = \sin ax^\circ$ and $y = \cos ax^\circ$	163 - 164	R5·1	
		16.6	Trig functions of the form $y = \sin ax^\circ + b$ and $y = \cos ax^\circ + b$	165 - 167	R5·1	
		16.7	Trig functions of the form $y = \sin(x - a)^\circ$ and $y = \cos(x - a)^\circ$	168	R5·1	
			Remember Remember	169		
17.	Surds and Indices	17.1	What is a surd ?	170	E1·1	
		17.2	Simplifying surds - adding, subtracting, multiplying and dividing	171 - 172	E1·1	
		17.3	Indices - revision of powers - exponents	173	E1·2	
		17.4	The rules of indices - multiplying, dividing and powers of powers	174 - 176	E1·2	
			$a^0 = 1$ and negative powers		E1·2	
		17.5	Fractional powers and connection with surds	177	E1·1/2	
			Remember Remember	178		
18.	Scattergraphs	18.1	Scattergraphs	179	A4·2	
		18.2	Scattergraphs and correlation	180 - 182	A4·2	
			Remember Remember	183		
	Home Exercise 6		Revision of Chapters 16 - 18	184		
			Revision of Chapters 1 - 18	185		
	Non-Calculator		Non-Calculator Exercise 6	186		