



**Lanark Grammar School
Mathematics Department**

**S4 National 5 Mathematics
2-Year
Course Outline**

S3

Skills and Understanding	Suggested Topic Workbook Resources	Video
Pythagoras' Theorem		
The Converse of Pythagoras' Theorem	N5 Pythagoras' Theorem	https://corbettmaths.com/2013/06/22/showing-a-triangle-is-right-angled/
2D Problem Questions	N5 Pythagoras' Theorem	https://corbettmaths.com/2013/06/22/pythagoras-rectangles-and-isosceles-triangles/
Distance Between Two Points	N5 Pythagoras' Theorem	https://corbettmaths.com/2013/05/03/distance-between-two-coordinates/
3D Pythagoras: Space Diagonals	N5 Pythagoras' Theorem	https://corbettmaths.com/2012/08/19/3d-pythagoras/
3D Problem Questions	N5 Pythagoras' Theorem	
Algebraic Expressions		
Simplifying expressions	N5 Brackets	
Expanding Single Brackets	N5 Brackets	https://corbettmaths.com/2013/12/23/expanding-brackets-video-13/
Expanding Double Brackets	N5 Brackets	https://corbettmaths.com/2013/12/23/expanding-two-brackets-video-14/
Expanding Square Brackets	N5 Brackets	https://www.youtube.com/watch?v=IhU1CzIUQMI
Factorising Common Factor	N5 Factorising	https://corbettmaths.com/2013/02/06/factorisation/
Factorising Difference of Two Squares	N5 Factorising	https://corbettmaths.com/2013/02/08/difference-between-two-squares/
Factorising Quadratics	N5 Factorising	https://corbettmaths.com/2013/02/06/factorising-quadratics-1/
		https://corbettmaths.com/2013/02/07/factorising-quadratics-2/
Order of factorising	N5 Factorising	

Completing the Square

Volumes of Solids

Volume of Cone, Sphere and Pyramid	N5 Volume	https://www.youtube.com/watch?v=YqDgwwH_HUs
		https://www.youtube.com/watch?v=sk2giMegFXs
Compound Shapes	N5 Volume	
Surface Area	N5 Volume	https://www.youtube.com/watch?v=6A5T9K_Mw-U
Problem Questions	N5 Volume	https://www.youtube.com/watch?v=JS5dav22vFc

Rounding

Rounding to decimal places with unrounded answer	N5 Significant Figures	https://corbettmaths.com/2013/09/07/rounding-to-1-or-2-decimal-places/
Rounding to Significant Figures	N5 Significant Figures	https://corbettmaths.com/2013/09/07/rounding-significant-figures/

Equations & Inequalities

Equations with Brackets	N5 Linear Equations & Inequations	https://www.youtube.com/watch?v=3kXMXj24ahQ
Equations with Fractions	N5 Linear Equations & Inequations	https://www.youtube.com/watch?v=ZZ8SacTv-JE
Harder Equations with Brackets + Fractions	N5 Linear Equations & Inequations	
Inequality Signs + Solving Inequations	N5 Linear Equations & Inequations	https://www.youtube.com/watch?v=PcLovmSrNi0

Simultaneous Equations

Graphical Solutions	N5 Simultaneous Equations	https://www.youtube.com/watch?v=iy9cRndBWkK&feature=youtu.be
Basic Elimination Method	N5 Simultaneous Equations	https://www.youtube.com/watch?v=-8vpwQa5dkk&feature=youtu.be
Further Elimination Method	N5 Simultaneous Equations	https://www.youtube.com/watch?v=dzZwY6eF2fA&feature=youtu.be
Problem Questions	N5 Simultaneous Equations	https://www.youtube.com/watch?v=robj1yvYw7o&feature=youtu.be

Fractions		
Simplifying Fractions	N5 Fractions	https://corbettmaths.com/2013/03/03/simplifying-fractions-2/
Mixed Numbers/Improper Fractions	N5 Fractions	https://corbettmaths.com/2013/02/15/mixed-numbers-to-improper-fractions/
		https://corbettmaths.com/2013/02/15/improper-fractions-to-mixed-numbers/
Adding/Subtracting basic	N5 Fractions	https://corbettmaths.com/2012/08/21/fractions-addition-and-subtraction/
Adding/Subtracting mixed numbers	N5 Fractions	
Multiplying	N5 Fractions	https://corbettmaths.com/2012/08/21/multiplying-fractions-2/
Dividing	N5 Fractions	https://corbettmaths.com/2012/08/21/division-with-fractions/
Fractions of a Quantity	N5 Fractions	https://corbettmaths.com/2012/08/20/fractions-of-amounts/
Fractions with a calculator (1.0)	N5 Fractions	
Percentages		
% of a Quantity Non Calculator	N5 Percentages	https://corbettmaths.com/2012/08/20/percentages-of-amounts-non-calculator/
% of a Quantity Calculator	N5 Percentages	https://corbettmaths.com/2013/02/15/percentages-of-an-amount-calculator/
Reverse Problems	N5 Percentages	https://corbettmaths.com/2013/02/15/reverse-percentages/
		https://www.youtube.com/watch?v=aFrqtrCRevo
Compound Interest Non Calculator	N5 Percentages	
Compound Interest Calculator	N5 Percentages	https://corbettmaths.com/2012/08/21/compound-interest/
Appreciation/Depreciation Non Calculator	N5 Percentages	
Appreciation/Depreciation Calculator	N5 Percentages	https://www.youtube.com/watch?v=rDtIhMqyj7w
Problem Questions	N5 Percentages	
Scatter Graphs and Line of Best Fit		

Drawing Scatter Graphs + Correlation	N5 Line of Best Fit	https://corbettmaths.com/2012/08/10/scatter-graphs/
		https://corbettmaths.com/2012/08/10/scatter-graphs-correlation/
Line of Best Fit	N5 Line of Best Fit	https://corbettmaths.com/2012/08/10/scatter-graphs/
Statistics		
Mean, Median, Mode, Range	N5 Statistics & Comparing Data Sets	https://corbettmaths.com/2012/08/02/the-mean/
		https://corbettmaths.com/2012/08/02/the-median/
5 Figure Summary with Box Plot, IQR, SIQR	N5 Statistics & Comparing Data Sets	https://corbettmaths.com/2013/05/15/drawing-and-reading-box-plots/
Comparing data	N5 Statistics & Comparing Data Sets	
Stem and Leaf	N5 Statistics & Comparing Data Sets	https://corbettmaths.com/2012/08/02/drawing-stem-and-leaf-diagrams/
		https://corbettmaths.com/2012/08/02/reading-stem-and-leaf-diagrams-video/
Standard Deviation	N5 Statistics & Comparing Data Sets	https://www.bbc.co.uk/bitesize/guides/zciv4wx/revision/2
Sine and Cosine Rules		
Area of a Triangle	N5 Triangle Trigonometry	https://corbettmaths.com/2012/08/02/area-of-a-triangle-sinetrigonometry/
Sine Rule - Missing Side	N5 Triangle Trigonometry	https://corbettmaths.com/2013/05/03/sine-rule-missing-sides/
Sine Rule - Missing Angle	N5 Triangle Trigonometry	https://corbettmaths.com/2019/04/24/sine-rule-angles/
Cosine Rule - Missing Side	N5 Triangle Trigonometry	https://corbettmaths.com/2013/04/04/cosine-rule-missing-sides/
Cosine Rule - Missing Angle	N5 Triangle Trigonometry	https://corbettmaths.com/2013/04/04/cosine-rule-missing-angles/
Choosing the correct Rule	N5 Triangle Trigonometry	
Bearing Problems	N5 Triangle Trigonometry	https://www.bbc.co.uk/bitesize/guides/zqwhjty/revision/1

Gradient		
Gradient Formula	N5 Calculating the Gradient of a Line	https://www.youtube.com/watch?v=xQ2inJSGT4
		https://www.youtube.com/watch?v=YFiQMue-0zE
Straight line graphs		
Equation $y = mx + c$	N5 Find the Equation of a Straight Line	https://www.youtube.com/watch?v=syVAOtg3VrY
Equation $y - b = m(x - a)$	N5 Find the Equation of a Straight Line	https://www.youtube.com/watch?v=syVAOtg3VrY
Rearranging Equations	N5 Find the Equation of a Straight Line	
Vectors		
Column Vectors and Vector Diagrams	N5 Vectors	https://www.youtube.com/watch?v=CEDyDMzIRFo
Multiplying a Vector	N5 Vectors	https://www.youtube.com/watch?v=FJWfVxZ7ERY
Vectors in Opposite Directions	N5 Vectors	https://www.bbc.co.uk/bitesize/guides/zwncsrd/revision/
Magnitude of a Vector	N5 Vectors	https://www.youtube.com/watch?v=xMLvDOHRD4c
Resultant Vector	N5 Vectors	https://www.bbc.co.uk/bitesize/guides/z8myrwx/revision/2
3D Vectors	N5 Vectors	https://www.bbc.co.uk/bitesize/guides/zgkx8mn/revision/1
Problem Questions	N5 Vectors	
Properties of shapes		
Angles and Triangles	N5 Properties of Shape	https://corbettmaths.com/2013/04/04/parallel-lines-angles/
Quadrilaterals, Parallel Lines and Angles	N5 Properties of Shape	https://corbettmaths.com/2013/03/17/angles-in-quadrilaterals/
Circle Properties	N5 Properties of Shape	https://corbettmaths.com/2014/10/02/angle-in-a-semi-circle-proof/

		https://corbettmaths.com/2014/10/02/angles-at-the-centre-and-circumference-proof/
		https://www.youtube.com/watch?v=J9CMVxM8QBQ
		https://www.youtube.com/watch?v=xXavNS0pySU
Angles and Polygons	N5 Properties of Shape	https://www.youtube.com/watch?v=MtEmjdFm3Fs

S3 Exam

S4

Surds

Introduction to surds	N5 Surds	https://corbettmaths.com/2013/05/11/surds/
Simplify Surds 4 operations + brackets	N5 Surds	https://www.youtube.com/watch?v=IhJ6aOmWq2U
		https://www.youtube.com/watch?v=uMrKBgTcAEs
		https://www.youtube.com/watch?v=GqpW6ohdnec
		https://www.youtube.com/watch?v=CeyvaH4BST4
Rationalising the denominator	N5 Surds	https://corbettmaths.com/2013/05/11/rationalising-denominators/

Indices

Multiplying	N5 Indices	https://www.youtube.com/watch?v=pTVPXW6AIAc
Dividing	N5 Indices	https://www.youtube.com/watch?v=H42VyzLlaKs
Power of a Power	N5 Indices	https://www.youtube.com/watch?v=-mGBjP-hlPY
Power of zero/one	N5 Indices	
Negative Indices	N5 Indices	https://www.youtube.com/watch?v=HcYIoI5Q8x4
Writing Scientific Notation	N5 Indices	https://corbettmaths.com/2013/04/28/standard-form/
Problems with a calculator	N5 Indices	https://corbettmaths.com/2013/04/29/standard-form-multiplication/
		https://corbettmaths.com/2013/05/03/standard-form-division/
Problems without a calculator	N5 Indices	
Fractional Powers	N5 Indices	https://www.youtube.com/watch?v=n28S7o6ebg4
Summer Break		
Algebraic Fractions		
Simplifying	N5 Algebraic Fractions	https://www.youtube.com/watch?v=EURpjy3MIgY&feature=youtu.be
Simplifying with factorising	N5 Algebraic Fractions	https://www.youtube.com/watch?v=J7YURrGxVdw&feature=youtu.be
Multiplying & Dividing	N5 Algebraic Fractions	https://www.youtube.com/watch?v=IVCaJzdH0zE&feature=youtu.be
Adding/Subtracting	N5 Algebraic Fractions	https://www.youtube.com/watch?v=TX5NcAVO39M&feature=youtu.be
Arcs and Sectors		
Length of an Arc	N5 Arc Length & Sector Area	https://www.youtube.com/watch?v=0q47i-q09tk&feature=youtu.be
Using Arc Length to find an angle	N5 Arc Length & Sector Area	https://www.youtube.com/watch?v=5e4jTEG1Lhk&feature=youtu.be
Using Arc Length to find the diameter/radius	N5 Arc Length & Sector Area	
Area of a Sector	N5 Arc Length & Sector Area	https://www.youtube.com/watch?v=0Y0JXL0qrlc&feature=youtu.be
Using Area of Sector to find an angle	N5 Arc Length & Sector Area	https://www.youtube.com/watch?v=5e4jTEG1Lhk&feature=youtu.be

Using Area of Sector to find diameter/radius	N5 Arc Length & Sector Area	
Algebraic Expressions		
Completing the Square	N5 Completing the Square	https://www.youtube.com/watch?v=VS6apvTv2Rc
		https://corbettmaths.com/2013/12/29/completing-the-square-video-10/
Formulae		
Change the subject basic	N5 Change the Subject of a Formula	https://www.youtube.com/watch?v=RCWoP69ooLA&feature=youtu.be
Change the subject powers and roots	N5 Change the Subject of a Formula	https://www.youtube.com/watch?v=FdB_q42PBt4&feature=youtu.be
Problem Questions	N5 Change the Subject of a Formula	
S4-6 Tracking Report		
September Weekend		
Functional Notation		
Substitution into Formulae & Functional Notation	N5 Functional Notation	https://www.youtube.com/watch?v=X0ydBv_M_jl
Quadratic Equations		
Solving equations by factorising	N5 Quadratic Graphs and Equations	https://corbettmaths.com/2013/05/03/solving-quadratics-by-factorising/
The quadratic formula	N5 Quadratic Graphs and Equations	https://corbettmaths.com/2013/04/24/quadratic-formula/
Nature of Roots with discriminant	N5 Quadratic Graphs and Equations	https://www.bbc.co.uk/bitesize/guides/zcwhjty/revision/1

Problem Questions	N5 Quadratic Graphs and Equations	
Quadratic Functions		
Drawing a Quadratic Function using a table	N5 Quadratic Graphs and Equations	https://corbettmaths.com/2013/06/23/drawing-quadratics/
Sketching a graphs of the form $y = k(x + p)^2 + q$	N5 Quadratic Graphs and Equations	
Sketching graphs of the from $y = ax^2+bx+c$	N5 Quadratic Graphs and Equations	
Sketching a graphs of the form $y = (x - a)(x - b)$	N5 Quadratic Graphs and Equations	https://corbettmaths.com/2013/06/22/sketching-quadratics/
October Break		
Assessment 1		
S4-6 Tracking Report		
Trigonometric Graphs		
Graph of Sine, Cosine and Tan $y=\sin x, y = \cos x, y = \tan x$	N5 Trig. Graphs	https://www.youtube.com/watch?v=JZGKeGdyWrs
Graph with changing amplitude $y=asin x, y=acos x$	N5 Trig. Graphs	https://www.youtube.com/watch?v=snhuWuvwiI0
Graph of changing period $y=\sin bx, y=\cos bx$	N5 Trig. Graphs	https://www.youtube.com/watch?v=f3ugUIDRxwA
Phase Angle $y=\sin(x-a), y=\cos(x-a)$	N5 Trig. Graphs	https://www.youtube.com/watch?v=YBKOnbeUm-s
S4-6Parents Evening		
Trigonometric Equations		
Basic Trig Equations	N5 Trig. Relationships, Equations & Identities	https://www.youtube.com/watch?v=aPzBZMb426Q

Further Trig Equations	N5 Trig. Relationships, Equations & Identities	https://www.youtube.com/watch?v=xhVMQXWSHjA
Trig Equations - negative	N5 Trig. Relationships, Equations & Identities	https://www.youtube.com/watch?v=XzJ5AobnPDo
Trigonometric Identities		
Trig Identities	N5 Trig. Relationships, Equations & Identities	
Similar Figures		
Linear Scale Factor	N5 Similarity	https://www.youtube.com/watch?v=CGV18vInguw
Area Scale Factor	N5 Similarity	https://www.youtube.com/watch?v=9Ef4lgbvF9A
Volume Scale Factor	N5 Similarity	https://www.youtube.com/watch?v=9Ef4lgbvF9A
Similar Triangles	N5 Similarity	
Christmas Break		
Prelim		
S4-6 Full Report		
N5 Numeracy - Catch Up Assessments		
February Break		
Flexible Time/Revision		
Final Prelim		
Spring Break		
Flexible Time/Revision		
S5/6 Study Leave Begins		
SQA National 5 Exam		

