

EDEXCEL A Level Further Mathematics – Further Pure 1 Scheme of Work

Examination in May of Year 12. Course teaching begins in September of Year 12.

The number of lessons stated is for teaching the unit. Allow more lessons for topic consolidation, assessment tests and revision informed by the test results.

The duration of the course is approximately 21 weeks, 2 lessons a week. Aim to finish teaching by the end of the spring term at the latest to allow much exam practice.

MATRIX ALGEBRA (12 lessons)

Topic	Syllabus	Resources	Lessons
Add and subtract matrices	Find the dimensions of a matrix and add and subtract matrices of the same dimension	Ex 4A p75	1
Multiply matrices	Multiply a matrix by a scalar and multiply matrices together	Ex 4B p77 AND Ex 4C p81-82	2
Linear transformations	Use matrices to describe linear transformations	Ex 4D p85-86	1
Transformations	Use matrices to represent rotations, reflections and enlargements	Ex 4E p90	1
Combined transformations	Use matrix products to represent combinations of transformations	Ex 4F p93-94	1
Inverse matrix	Find the inverse of a 2 x 2 matrix (where it exists)	Ex 4G p97-98	1
Inverse matrix	Use inverse matrices to reverse the effect of a linear transformation	Ex 4H p100-101	1
Determinant	Use the determinant of a matrix to determine the area scale factor of the transformation	Ex 4I p102-103	1
Linear equations	Use matrices and their inverses to solve linear simultaneous equations	Ex 4J p104	1
Solve problems	Solve a variety of problems involving matrices	Mixed Ex 4K p104-105	2
Assessment – Matrices			

COMPLEX NUMBERS (10 lessons)

Topic	Syllabus	Resources	Lessons
Real and imaginary numbers	Use real and imaginary numbers, add and subtract complex numbers	Ex 1A p4-5	1
Powers of i	Multiply complex numbers and simplify powers of i	Ex 1B p6	1
Complex conjugate	Find the complex conjugate of a complex number	Ex 1C p9-10	1
Argand diagram	Represent complex numbers on an Argand diagram	Ex 1D p14	1
Modulus and argument of z	Find the value of r , the modulus of a complex number z , and the value of θ , the argument of z	Ex 1E p18	1
	Find the modulus-argument form of the complex number z	Ex 1F p21	1
Complex numbers	Solve problems involving complex numbers	Ex 1G p23	1
Polynomial equations	Solve some types of polynomial equations with real coefficients	Ex 1H p29-29	1
	Solve a variety of problems involving complex numbers	Mixed Ex 1I p29-30	2
Assessment – Complex Numbers			

COORDINATE SYSTEM (10 LESSONS)

Topic	Syllabus	Resources	Lessons
	Know what parametric equations are, sketch these and find the Cartesian equation of curves given by parametric equations	Ex 3A p44-45	1-2
	Know the general equation of a parabola and find the line l that intersects the parabola	Ex 3B p48 Ex 3C p50-51	2-3
	Know an equation for a rectangular hyperbola and can find tangents and normals	Ex 3D p56 Ex 3E p59-60	3
	Solve a variety of problems involving complex numbers	Mixed Ex 3F p60-61	2
Assessment – Coordinate system			

NUMERICAL SOLUTIONS OF EQUATIONS (5 LESSONS)

Topic	Syllabus	Resources	Lessons
	Solve equations of the form $f(x) = 0$ using interval bisection	Ex 2A p34	1
	Solve equations of the form $f() = 0$ using linear interpolation	Ex 2B p37	1
	Solve equations of the form $f(x) = 0$ using the Newton-Raphson process	Ex 2C p39	1
	Solve a variety of problems involving numerical solutions of equations	Mixed Ex 2D p40	2
Assessment – Numerical solutions of equations			

SUMMATION OF SERIES (7 lessons)

Topic	Syllabus	Resources	Lessons
	Use sigma notation to define series (Should be revision)	Ex 5A p109-110	1
	Use the formula for the sum of the first n natural numbers	Ex 5B p111	1
	Use the formula $a\sum r + b\sum I = \sum (ar + b)$	Ex 5C p113-114	1
	Use the formula for the sum of the squares of the first n natural numbers and the sum of the cubes of the first n natural numbers	Ex 5D p115-116	1
	Use known formulae to sum more complex series	Ex 5E p118-119	1
	Solve a variety of problems involving series	Misex Ex 5F p119-110	2
Assessment - Series			

PROOF BY INDUCTION (6 lessons)

Topic	Syllabus	Resources	Lessons
	Obtain a proof for the summation of a series using induction	Ex 6A p127	1
	Use proof by induction to prove that an expression is divisible by a certain integer	Ex 6B p130	1
	Use mathematical induction to produce a proof for a general term of a recurrence relation	Ex 6C p132-133	1
	Use proof by induction to prove general statements involving matrix multiplication	Ex 6D p134	1
Induction.	Solve a variety of problems involving proof by induction	Mixed Ex 6E p135	2
Assessment – Mathematical Induction			

ASSESSMENTS

Students should complete an assessment test at the end of each unit of work. Marks for these assessments should be recorded on G4S as they are complete.

Exam past papers should be used for preparation for the examination in June.