FP1

FP1 topics	MEI	OCR	AQA	EDEXCEL
Topic: Matrices				
Add, subtract, multiply	**FP1**	**FP1**	**FP1**	**FP1**
Zero, identity	**FP1**	**FP1**	**FP1**	**FP1**
Linear transformation	**FP1**	**FP1**	**FP1**	**FP1**
Successive transformations	**FP1**	**FP1**	**FP1**	**FP1**
Invariant points	**FP1**			
Determinant 2×2	**FP1**	**FP1**	**FP4**	**FP1**
Determinant as scale factor, zero determinant	**FP1**	**FP1**		
Find inverse matrix 2×2	**FP1**	**FP1**	**FP4**	**FP1**
Product rule for inverse matrices	**FP1**	**FP1**	**FP4**	
Solving simultaneous linear equations	**FP1**	**FP1**		
Topic: Complex Numbers				
$\sqrt{-1}$	**J**	**I**	**I**	**i**
Solve quadratic	**FP1**	**FP1**	**FP1**	**FP1**
Add, subtract, multiply complex numbers	**FP1**	**FP1**	**FP1**	**FP1**
Divide	**FP1**	**FP1**	**FP1**	**FP1**
Zero	**FP1**	**FP1**	**FP1**	**FP1**
Conjugate pairs	**FP1**	**FP1**	**FP1**	**FP1**
Solve equations with real coefficients (higher degree)	**FP1**			**FP1**
Argand diagram	**FP1**	**FP1**	**FP2**	**FP1**
Modulus-argument form	**FP1**		**FP2**	**FP1**
Loci	**FP1**	**FP1**	**FP2**	**FP2**
Topic: Graphs and Inequalities				
Sketching rational functions	**FP1**	**FP2**	**FP1**	
Inequalities	**FP1**			**FP1**
Topic: identities and roots of equations				
identities	**FP1**			
Roots of polynomial equations	**FP1**	**FP1**	**FP1**	
Topic: Induction and series				
Proof by induction	**FP1**	**FP1**		**FP1**
Standard results	**FP1**	**FP1**	**FP1**	**FP1**
Summation of finite series	**FP1**	**FP1**	**FP2**	**FP2**

FP2

FP2	MEI	OCR	AQA	EDEXCEL
Topic: Calculus				
Definitions of inverse trigonometric functions.	**FP2**	**FP2**	**FP2**	**FP3**
Be able to differentiate inverse trigonometric functions.	**FP2**	**FP2**	**FP2**	**FP3**
Topic: Polar coordinates				
Convert from polar coordinates (r, θ) to cartesian co-ordinates and vice-versa.	**FP2**	**FP2**	**FP3**	**FP2**
Be able to sketch curves with simple polar equations	**FP2**	**FP2**	**FP3**	**FP2**
Be able to find the area enclosed by a polar curve	**FP2**	**FP2**	**FP3**	**FP2**
Topic: Complex Numbers				
Multiply and divide complex numbers in polar form.	**FP2**	**FP3**	**FP2**	**FP2**
Multiplication in the Argand diagram	**FP2**		**FP2**	**FP2**
Understand de Moivre's theorem.	**FP2**	**FP3**	**FP2**	**FP2**
Complex exponents	**FP2**			**FP2**
Summation using complex numbers	**FP2**			
Complex roots of unity	**FP2**	**FP3**	**FP2**	
Complex roots: the general case	**FP2**	**FP3**	**FP2**	**FP2**
Geometric uses of complex numbers	**FP2**			
Topic: Power series				
Polynomial approximations	**FP2**	**FP2**	**FP3**	**FP2**
Power series	**FP2**	**FP2**	**FP3**	**FP2**
Topic: Matrices				
Determinant and inverse of a 3x3 matrix.	**FP2**	**FP1**	**FP4**	**FP3**
Eigenvalues and eigenvectors	**FP2**		**FP4**	**FP3**
Matrices and simultaneous equations.	**FP2**		**FP4**	
Cayley-Hamilton Theorem	**FP2**			
Option 1: Hyperbolic functions				
Hyperbolic Sine and cosine functions	**FP2**	**FP2**	**FP2**	**FP3**
Other hyperbolic functions	**FP2**	**FP2**	**FP2**	**FP3**
Be able to differentiate and integrate hyperbolic functions.	**FP2**	**FP2**	**FP2**	**FP3**
The inverse hyperbolic fundction	**FP2**	**FP2**	**FP2**	**FP3**
Option 2: Investigation of curves				
Defining curves	**FP2**			
Properties of curves	**FP2**			
Families of curves	**FP2**			
Using calculus	**FP2**			
Conics.	**FP2**			**FP3**

Specification Mapping for DE

DE	MEI	OCR	AQA	EDEXCEL
Topic: Modelling with Differential Equations				
Formulation of 1st and 2nd order DE's.	**DE**		**C4**	**C4**
Knowledge of the language of kinematics.	**DE**	**M3**		
Newton's 2nd law of motion.	**DE**		**M2**	
Determination of order of a DE.	**DE**	**FP3**	**FP3**	
Interpretation of solution in terms of original situation.	**DE**	**FP3**		
Difference between general and particular solutions.	**DE**			
Significance of arbitrary constants in general solution.	**DE**			
Effect of changing a DE on its solution.	**DE**			
Sketch and interpret tangent field for 1st order DE.	**DE**			
Sketch and interpret solution curve for particular conditions.	**DE**			
Isoclines.	**DE**			
Topic: First order differential equations				
Solution of 1st order linear DE's with constant coefficients.	**DE**	**FP3**	**FP3**	**FP2**
Rearrange (if necessary) to solve using an integrating factor.	**DE**	**FP3**	**FP3**	**FP2**
Finding an IF and understanding its significance.	**DE**	**FP3**	**FP3**	**FP2**
Solution of DE using IF to get both general and particular solutions.	**DE**	**FP3**	**FP3**	**FP2**
Topic: Second and Higher Order Differential Equations				
Solution using auxiliary equation and complementary function.	**DE**	**FP3**	**FP3**	**FP2**
Interpretation of nature of roots of aux. equation and graphs of solution to DE.	**DE**	**FP3**	**FP3**	**FP2**
Finding particular solution.	**DE**	**FP3**	**FP3**	**FP2**
Solution using homogeneous case plus particular integral.	**DE**	**FP3**	**FP3**	**FP2**
Finding PIs in simple cases. Graphical interpretation using roots of aux. equation.	**DE**		**FP3**	
Solution of equation for simple harmonic motion.	**DE**	**M3**	**M5**	**FP2, M3**
Model these using 2nd order linear DE's.	**DE**		**M5**	**M4**
Graphical and verbal interpretation of solutions.	**DE**			**M4**
Extension of these methods to higher order equations in simple cases.	**DE**			
Topic: Simultaneous Differential Equations				
Model and solve situations with one independent variable and 2 dependent variables by using sim. equations with two 1st order DE's to get a single 2nd order DE.	**DE**		**FP3**	**FP2**
Extension to more than two equations.	**DE**			
Topic: Numerical Methods				
Step by Step Methods	**DE**		**FP3**	**FP3**

Specification Mapping for NM

(Note: there is a small section on numerical methods in the A2 core. Topics that are introduced at A2 are shown in square brackets)

NM	MEI	OCR	AQA	EDEXCEL
Topic: Approximations and errors				
Absolute and relative errors	**NM**	**FP2**		
Rounding and interval estimates	**NM**			
Error propagation and ill conditioning	**NM**			

Topic: Solution of equations				
Bisection	**NM [C3]**	**[C3]**	**[C3]**	**FP1 [C3]**
Fixed point iteration	**NM [C3]**	**[C3]**	**[C3]**	**FP1 [C3]**
The Newton Raphson method	**NM [C3]**	**FP2**	**FP1**	**FP1**
The secant method	**NM**			
The method of false propositions	**NM**			
Graphical interpretation of these methods	**NM [C3]**	**FP2**	**FP1 [C3]**	
Topic: Numerical differentiation				
The forward difference method	**NM**			
The central difference approximation	**NM**			
Calculating the error in f(x) when there is an error in x	**NM**			
Topic: Numerical integration				
The mid-point rule	**NM**	**FP2**	**[C3]**	
The trapezium rule	**NM [C4]**	**[C2]**	**[C2]**	**[C4]**
Simpson's rule	**NM**		**[C3]**	
The relationship between the methods	**NM**			
Topic: Approximating functions				
Finite difference tables	**NM**			
Newton's forward difference interpolation method	**NM**			
Lagrange's form of the interpolating polynomial	**NM**			