

<h1>Personalised Learning Checklist</h1> <p>MEI A Level Maths/Further Maths Module C3</p>	R	A	G
	1. Proof		
Understand, and be able to use, proof by direct argument, exhaustion and contradiction.			
Be able to disprove a conjecture by the use of a counter example			
2. Exponentials and Logarithms			
Understand and be able to use simple properties of exponential and logarithmic functions			
Know the relationship between $\ln x$ and e^x			
Know the relationship between the graphs of $y = \ln x$ and $y = e^x$			
Be able to solve problems involving exponential growth and decay.			
3. Functions			
Understand the definition of a function, and the associated language.			
Know the effect of combined transformations on a graph and be able to form the equation of the new graph.			
Be able, given the graph of $y = f(x)$, to sketch related graphs			
Be able to apply transformations to the basic trigonometrical functions.			
Know how to find a composite function, $gf(x)$			
Know the conditions necessary for the inverse of a function to exist and how to find it (algebraically and graphically).			
Understand the functions \arcsin , \arccos and \arctan , their graphs and appropriate restricted domains.			
Understand what is meant by the terms odd, even and periodic functions and the symmetries associated with them.			
Understand the modulus function.			

Be able to solve simple inequalities containing a modulus sign.			
4. Differentiation			
Be able to differentiate the product of two functions.			
Be able to differentiate the quotient of two functions.			
Be able to differentiate composite functions using the chain rule.			
Be able to find rates of change using the chain rule.			
Be able to differentiate an inverse function.			
Be able to differentiate a function defined implicitly.			
Be able to differentiate e^{ax} and $\ln x$			
Be able to differentiate the trigonometrical functions: $\sin x$, $\cos x$ and $\tan x$			
5. Integration			
Be able to use integration by substitution in cases where the process is the reverse of the chain rule.			
Be able to use integration by substitution in other cases.			
Be able to integrate $1/x$ and e^{ax}			
Be able to integrate $\sin x$ and $\cos x$			
Be able to use the method of integration by parts where the process is the reverse of the product rule.			
Be able to apply integration by parts to $\ln x$			
6. Numerical Methods (coursework only)			
Be able to locate the roots of $f(x) = 0$ by considering changes of sign of $f(x)$ in an interval of x in which $f(x)$ is continuous			
Understand when change of sign methods may fail to give an expected root or may give a false root.			

Be able to carry out a fixed point iteration after rearranging an equation into the form $x = g(x)$			
Understand in fixed point iteration that not all iterations converge to a particular root of an equation.			
Be able to use the Newton-Raphson method to solve an equation.			
Appreciate the need to establish error bounds when applying a numerical method.			
Be able to give a geometrical interpretation both of the processes involved and of their algebraic representation.			