

Module C3.1	Content & Page Reference (P1, P2 & P3 books)	Time
Algebra & Functions. Topic 8 P1. Topic 2 P2. Topic 9 P2. Topic 11 P2. 12 hours.	<ul style="list-style-type: none"> Understand the terms function, domain, range. Identify the range of a given function in simple cases. 	1 hour.
	<p>Ex 8A p96-97</p> <ul style="list-style-type: none"> Understand the terms one-one function, inverse function and composition of functions. Identify the range of a given function in simple cases. Find the composition of two given functions. Determine whether or not a given function is one-one and find the inverse of a one-one function in simple cases. Illustrate in graphical terms the relation between a one-one function and its inverse. 	4 hours.
	<p>Ex 2A p199-201 & Ex 2B p206-208</p> <ul style="list-style-type: none"> Use and recognise compositions of transformations of graphs, such as the relationship between the graphs of $y = f(x)$ and $y = af(x + b)$ where a and b are constants. 	1 hour.
	<p>Ex 8C p104-106 revisited specific questions plus other resources</p> <ul style="list-style-type: none"> Understand the notation for modulus of x. Solve equations and inequalities involving the modulus function. Understand the relationship between the graphs of $y = f(x)$ and $y = f(x)$. 	2 hours.
	<p>Ex 9A p283 & Ex 9B p287-288</p> <ul style="list-style-type: none"> Understand the properties of the exponential and logarithmic functions e^x and $\ln x$, and their graphs, including their relationship as inverse functions. Understand exponential growth and decay. <p>Introduce the exponential function and natural logarithm \ln. Use this approach to solve relevant problems in Ch 11 P2. Ex 11A p311-312 & Ex 11B p316-317. Note change of emphasis in new specification, choose questions carefully.</p>	4 hours.

<p>Module C3.2 Trigonometry. Topic 1 P3. 7 hours.</p>	<ul style="list-style-type: none"> • Use the notations for inverse sin, cos and tan to denote the principal values of the inverse trigonometric relations, and relate their graphs (for the appropriate domains) to those of sine, cosine and tangent. <p>P3 Ex 1E p16</p> <ul style="list-style-type: none"> • Understand the relationship of the secant, cosecant and cotangent functions to cosine, sine and tangent, and use properties and graphs of all six trigonometric functions for angles of any magnitude. <p>P3 Ex 1A selected questions Use trigonometrical identities for the simplification and exact evaluation of expressions, and in the course of solving equations within a specified interval, and select an identity or identities appropriate to the context, showing familiarity, in particular with the use of</p> <ul style="list-style-type: none"> • Use of Pythagorean trig identities. <p>P3 Ex 1A selected questions</p> <ul style="list-style-type: none"> • The expansions of $\sin(A+B)$, $\sin(A-B)$, $\cos(A+B)$, $\cos(A-B)$, $\tan(A+B)$ and $\tan(A-B)$. <p>P3 Ex 1B p9</p> <ul style="list-style-type: none"> • The formulae for $\sin 2A$, $\cos 2A$ and $\tan 2A$. <p>P3 Ex 1C p11</p> <ul style="list-style-type: none"> • The expression of $a\cos x + b\sin x$ in the form $R\sin(x+p)$, $R\sin(x-p)$, $R\cos(x+p)$ & $R\cos(x-p)$. <p>P3 Ex 1D p14</p>	<p>1 hour.</p> <p>1 hour.</p> <p>1 hour.</p> <p>1 hour.</p> <p>1 hour.</p> <p>2 hours.</p>
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<p>Module C3.3 Differentiation and Integration. Topic 12 P2. Topic 13 P2. Topic 8 P3. Topic 10 P3. Topic 7 P2.</p>	<ul style="list-style-type: none"> • Use the derivatives of $\exp(x)$ and $\ln x$ integrals of $1/x$ and $\exp(x)$, together with constant multiples, sums and differences. Understand and use the relation $(dy/dx) = 1/(dx/dy)$. • Ex 12A p324 and demonstrate how to differentiate $y = \ln x$ (use the relation $(dy/dx) = 1/(dx/dy)$). • Differentiate composite functions using the chain rule. Ex 13A p338-339 • Apply differentiation to connected rates of change. Ex 13B p342-343. • Differentiate products and quotients. P3 Ex 8A p104-105 & Ex 8C p112. • Integrate expressions involving a linear substitution. P3 Ex 10A p132-133, Ex 10B p134-135? & Ex 10C p137-138. • Use definite integration to find a volume of revolution about one of the co-ordinate axes (including regions between curves). Ex 7 p258 	<p>2 hours.</p> <p>2 hours.</p> <p>1 hour.</p> <p>2 hours.</p> <p>5 hours?</p> <p>2 hours</p>
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<p>Module C3.4 Numerical Methods. 4 hours</p>	<ul style="list-style-type: none"> • Locate approximately a root of an equation, by means of graphical consideration and/or searching for a sign change. Ex 14A p349 • Understanding the idea of, and use the notation for, a sequence of approximations which converges to a root of an equation. Understand how a given simple iterative formula relates to the equation being solved. Use a given iteration or an iteration based on a given rearrangement of an equation, to determine a root to a prescribed degree of accuracy (knowledge of the condition for convergence is not included, but candidates should understand that an iteration may fail to converge). Ex 14B p351-352 • Carry out numerical integration of functions by means of Simpson's Rule. P5 Ex 10D* some reference to Simpson's Rule. Apply to appropriate examples 	<p>1 hour.</p> <p>2 hours.</p> <p>1 hour.</p>
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