

Syllabus Content: Introduction to Complex Numbers N1**Content:** Other representations of complex numbers N1.3**Student Outcomes:** MEX – 12.1, 4, 7 and 8

A student:

- › understands and uses different representations of numbers and functions to model, prove results and find solutions to problems in a variety of contexts MEX12-1
- › uses the relationship between algebraic and geometric representations of complex numbers and complex number techniques to model and solve problems MEX12-4
- › applies various mathematical techniques and concepts to prove results, model and solve structured, unstructured and multi-step problems MEX12-7
- › communicates and justifies abstract ideas and relationships using appropriate language, notation and logical argument MEX12-8

	Student is able to:	Implications, considerations and implementations	Resources
(i)	understand Euler's formula, $e^{ix} = \cos x + i \sin x$, for real x	1A The arithmetic of complex numbers 1B Quadratic equations 1C The Argand diagram 1D Modulus-argument form 1E Vectors and the complex plane 1F Curves and regions in the Argand diagram 1G Polynomials and complex numbers	
(ii)	represent and use complex numbers in exponential form, $z = re^{i\theta}$, where r is the modulus of z and θ is the argument of z		
(iii)	use Euler's formula to link polar form and exponential form		
(iv)	convert between Cartesian, polar and exponential forms of complex numbers		
(v)	find powers of complex numbers using exponential form		
(vi)	use multiplication, division and powers of complex numbers in polar form and interpret these geometrically		
(vii)	solve problems involving complex numbers in a variety of forms		

