Syllabus Content: Vectors V1
Content: Vector and Vector Equations of Lines V1.3

Student Outcomes: MEX 12 - 3, 7, 8
› uses vectors to model and solve problems in two and three dimensions MEX12-3
› applies various mathematical techniques and concepts to 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)	use Cartesian coordinates in two and three-dimensional space	(A) The vector equation of a line (B) Conjugate zeroes of polynomials	
(ii)	recognise and find the equations of spheres		
(iii)	use vector equations of curves in two or three dimensions involving a parameter, and determine a corresponding Cartesian equation in the two-dimensional case, where possible		
(iv)	understand and use the vector equation $\underset{\sim}{r} = \underset{\sim}{a} + \lambda \underset{\sim}{b}$ of a straight line through points A and B where R is a point on AB, $\underset{\sim}{a} = \overrightarrow{OA}$, $\underset{\sim}{b} = \overrightarrow{AB}$, λ is a parameter and $\underset{\sim}{r} = \overrightarrow{OR}$		
(v)	make connections in two dimensions between the equation $\underset{\sim}{r} = \underset{\sim}{a} + \lambda \underset{\sim}{b}$ and $y = mx + c$		
(vi)	determine a vector equation of a straight line or straight-line segment, given the position of two points or equivalent information, in two and three dimensions		

(vii)	determine when two lines in vector form are parallel		
(viii)	determine when intersecting lines are perpendicular in a plane or three dimensions		
(ix)	determine when a given point lies on a given line in vector form		