

Topics	What students need to learn:		
	Content	Guidance	
10 Vectors	10.1	Use vectors in two dimensions and in three dimensions	Students should be familiar with column vectors and with the use of \mathbf{i} and \mathbf{j} unit vectors in two dimensions and \mathbf{i}, \mathbf{j} and \mathbf{k} unit vectors in three dimensions.
	10.2	Calculate the magnitude and direction of a vector and convert between component form and magnitude/direction form.	Students should be able to find a unit vector in the direction of a, and be familiar with the notation a.
	10.3	Add vectors diagrammatically and perform the algebraic operations of vector addition and multiplication by scalars, and understand their geometrical interpretations.	The triangle and parallelogram laws of addition. Parallel vectors.
	10.4	Understand and use position vectors; calculate the distance between two points represented by position vectors.	$\vec{OB} - \vec{OA} = \vec{AB} = \mathbf{b} - \mathbf{a}$ The distance d between two points (x_1, y_1) and (x_2, y_2) is given by $d^2 = (x_1 - x_2)^2 + (y_1 - y_2)^2$
	10.5	Use vectors to solve problems in pure mathematics and in context, (including forces).	For example, finding position vector of the fourth corner of a shape (e.g. parallelogram) $ABCD$ with three given position vectors for the corners A, B and C. Or use of ratio theorem to find position vector of a point C dividing AB in a given ratio. Contexts such as velocity, displacement, kinematics and forces will be covered in Paper 3, Sections 6.1, 7.3 and 8.1 – 8.4