**Y13 A-level Mathematics**

**33 Vectors 0.5 weeks**

## Teaching objectives

**a** Use vectors in two dimensions and three dimensions

**b** Calculate the magnitude and direction of a vector and convert between component form and magnitude/direction form.

**c** Add vectors diagrammatically and perform the algebraic operations of vector addition and multiplication by scalars, and understand their geometrical interpretations.

**d** Understand and use position vectors; calculate the distance between two points represented by position vectors

**e** Use vectors to solve problems in pure mathematics and in context, including forces and kinematics.

**Resources for advance preparation:**

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| --- | --- | --- | --- | --- |
|  | **Starter** | **Main teaching**  Including key questions, key teaching points, models and resources | **Notes**  Including Support and Extension | **Consolidation/Plenary**  Including key questions and homework |
| 1 & 2 | Mini-whiteboard: Quick review questions about 2d vectors (magnitude, direction, addition, subtraction etc) | [[MEI: Properties of 3D vectors](http://mei.org.uk/files/sow/32-vectors-res.pdf)](http://mei.org.uk/files/sow/32-vectors-res.pdf)  (to develop fluency with vectors and working in 3d)  Visualising 3d vectors <https://www.geogebra.org/m/VHQzeMX9>  Key Question    Key Question:  [UM: Vector geometry question](https://undergroundmathematics.org/vector-geometry/r8215)  Link to Mechanics (and parametrics)  [UM: One Windy Day](https://undergroundmathematics.org/vector-geometry/one-windy-day)    (from AQA teaching guidance) | This should be a review of AS content but now in 3 dimensions. May only need to be one lesson but combined with other resources from forces & kinematics.  Students need to become familiar with both column vectors and **i,j,k** notation, where **i,j, and k** are unit vectors in mutually perpendicular directions in a right-handed coordinate system. (AQA teaching guidance)  Take care with notation.  Support: Use the resources in 2D.  Extension:  [UM: Vector Geometry 3 lines](https://undergroundmathematics.org/vector-geometry/three-lines) | Topic test (integral)  [Solomon worksheet](http://pmt.physicsandmathstutor.com/download/Maths/A-level/C4/Worksheets-Notes/Solomon/C4%20Vectors%20B%20-%20Questions.pdf)  [Solutions](http://pmt.physicsandmathstutor.com/download/Maths/A-level/C4/Worksheets-Notes/Solomon/C4%20Vectors%20B%20-%20Answers.pdf) |