

Vectors.

Vectors may be represented by relating them to unit vectors \underline{i} and \underline{j} which are perpendicular.

Usually \underline{i} is thought of in the x direction, but \underline{i} , \underline{j} may be in any plane, although usually it is horizontal.

Vectors can also be represented by a pair of values eg $A = 3\underline{i} - 2\underline{j}$ can also be written $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$

Adding vectors adds the corresponding components

The magnitude of a vector is written as $|A|$.

In the above case

$$|A| = \sqrt{3^2 + (-2)^2} \quad (\text{Pythagoras}).$$

Vectors can also be described by their magnitude and direction - not using components. In this case the vectors can be analysed purely geometrically

In the worked examples 1, 3 and 4 - using components to define and analyse the problem.

Example 2 just uses relative directions and the magnitude of the vectors.