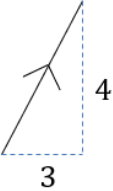


Modelling with vectors

In Mechanics, you will see certain things can be represented as a simple number (without direction), or as a vector (with direction):

Remember a 'scalar' just means a normal number (in the context of vectors). It can be obtained using the **magnitude** of the vector.

Vector Quantity	Equivalent Scalar Quantity
<p>Velocity e.g. $\begin{pmatrix} 3 \\ 4 \end{pmatrix} \text{ km/h}$</p> <p>This means the position vector of the object changes by $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$ each hour.</p> 	
<p>Displacement e.g. $\begin{pmatrix} -5 \\ 12 \end{pmatrix} \text{ km}$</p>	

Examples

1. A girl walks 2 km due east from a fixed point O to A , and then 3 km due south from A to B . Find
 - a) the total distance travelled
 - b) the position vector of B relative to O
 - c) $|\overrightarrow{OB}|$
 - d) The bearing of B from O .

2. In an orienteering exercise, a cadet leaves the starting point O and walks 15 km on a bearing of 120° to reach A , the first checkpoint. From A he walks 9 km on a bearing of 240° to the second checkpoint, at B . From B he returns directly to O .

Find:

- a) the position vector of A relative to O
- b) $|\overrightarrow{OB}|$
- c) the bearing of B from O
- d) the position vector of B relative to O .