8D Vectors

Scalar quantities (magnitude only)

Quantity	Description	Unit
Distance	Measure of length	m
Speed	Measure of how quickly something moves	ms^{-1}
Time	Measure of ongoing events	s
Mass	Measure of the quantity of matter in an object	kg

Vector quantities (magnitude and direction)

Quantity	Description	Unit
Displacement	Distance in a specific direction	m
Velocity	Rate of change of displacement	ms^{-1}
Acceleration	Rate of change of velocity	ms^{-2}
Force / weight	Described by magnitude, direction and point of application	N

1. Fully describe the motion of the particles below:

	A	B	C	D
Velocity	+ve	+ve	-ve	-ve
Acceleration	+ve	-ve	-ve	+ve

Positive direction

2D Notation

2. The velocity of a particle is given by $v = 3\boldsymbol{i} + 5\boldsymbol{j}\ ms^{-1}$

Find:

a) The speed of the particle

b) The angle the direction of motion of the particle makes with the unit vector **i**.

3. A man walks from A to B and then from B to C. His displacement from A to B is 6**i** + 4**j** km. His displacement from B to C is 5**i** – 12**j** km.

a) What is the magnitude of the displacement from A to C?

b) What is the total distance the man walked in getting from A to C?