**8A Movement on a Plane**

1. A particle starts from the point with position vector and moves with constant velocity .
2. Find the position vector of the particle after 4 seconds
3. Find the time at which the particle is due east of the origin
4. A particle has velocity at time . The particle moves with constant acceleration . Find the speed of the particle and the bearing on which it is travelling at time 3 seconds.
5. An ice skater is skating on a large flat ice rink. At time the skater is at a fixed point and is skating with velocity .

At time the skater is travelling with velocity .

Relative to , the skater has position vector at time seconds.

Modelling the skater as having constant acceleration, find:

1. The acceleration of the ice skater
2. An expression for in terms of
3. Find the time at which the skater is directly north-east of O
4. A second skater travels such that she has position vector relative to the same point at time .