# 10B Forces as Vectors

1. The forces $2\mathbf{i} + 3\mathbf{j}$, $4\mathbf{i} - \mathbf{j}$, $-3\mathbf{i} + 2\mathbf{j}$ and $x\mathbf{i} + y\mathbf{j}$ act on an object which is in equilibrium. Find the values of x and y.

2. In this question i represents the unit vector due east, and j represents the unit vector due north. A particle begins at rest at the origin. It is acted on by three forces $(2\mathbf{i} + \mathbf{j})N$, $(3\mathbf{i} - 2\mathbf{j})N$ and $(-\mathbf{i} + 4\mathbf{j})N$.

a) Find the resultant force in the form $p\mathbf{i} + q\mathbf{j}$

b) Work out the magnitude and bearing of the resultant force

c) Describe the motion of the particle