**Forces as Vectors**

Forces have direction, and therefore we can naturally write them as vectors, either in $i$**-**$j$notation or as column vectors.

Add the vectors of two or more forces to find the resultant force.

**Example**

The forces (3***i*** - 4***j***), (2***i*** + 5***j***) and (a***i*** + b***j***) act on a particle in equilibrium. Find the values of a and b.

*If the particle is in equilibrium, what is the value of the resultant force?*

We can use Pythagoras and trignometry to find the magnitude and bearing of a force when it is in vector form.

**Example**

The vector $i$ is due east and $j$ due north. A particle begins at rest at the origin. It is acted on by three forces $\left(2i+j\right)$ N, $\left(3i-2j\right)$ N and $\left(-i+4j\right)$ N.

1. Find the resultant force in the form $pi+qj$.
2. Work out the magnitude and bearing of the resultant force.

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