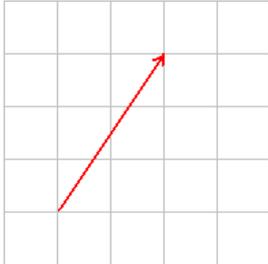


# Resolving Vectors

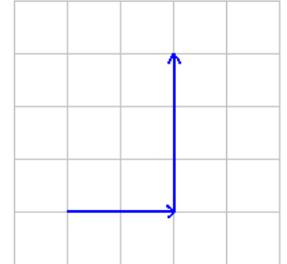
To be able to resolve vectors into their vertical and horizontal components  
 To be able to add vectors and find the resultant by resolving them  
 To know what equilibrium is and how it is achieved

## Resolving Vectors

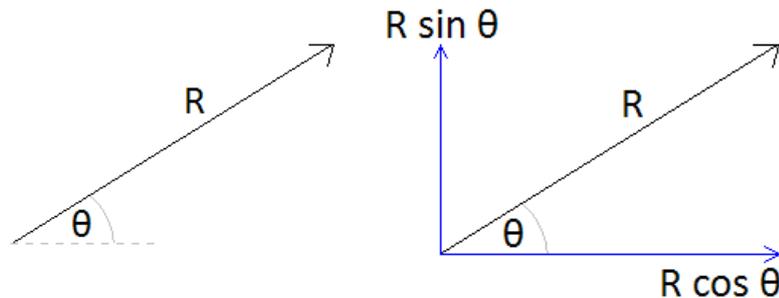
A vector can be 'broken down' or *resolved* into its vertical and horizontal components.



We can see that this vector can be resolved into two perpendicular components, in this case two to the right and three up. This is obvious when it is drawn on graph paper but becomes trickier when there isn't a grid and still requires an element of scale drawing.

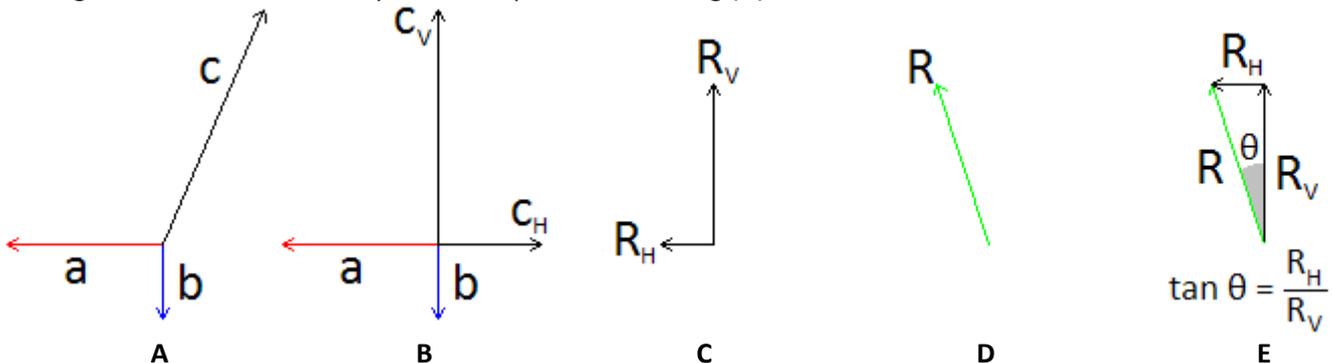


We can calculate the vertical and horizontal components if we know the magnitude and direction of the vector. In other words; we can work out the across and upwards bits of the vector if we know the length of the line and the angle between it and the horizontal or vertical axis.



## Adding Resolved Vectors

Now that we can resolve vectors into the vertical and horizontal components it is made from we can add them together. Look at this example of multiple vectors acting (A).

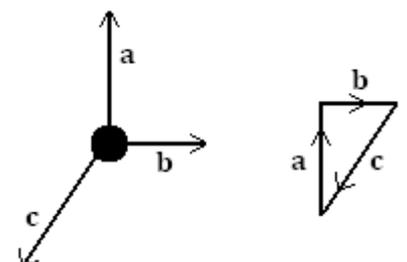


If we resolve the vector **c** we get (B). We can now find the resultant of the horizontal components and the resultant of the vertical components (C). We can then add these together to find the resultant vector (D) and the angle can be found using trigonometry (E)

## Equilibrium

When all the forces acting on a body cancel out equilibrium is reached and the object does not move. As you sit and read this the downwards forces acting on you are equally balanced by the upwards forces, the resultant it that you do not move.

With scale drawing we can draw the vectors, one after the other. If we end up in the same position we started at then equilibrium is achieved.



With resolving vectors we can resolve all vectors into their vertical and horizontal components. If the components up and down are equal and the components left and right are equal equilibrium has been reached.