

Scalars and vectors

- A scalar is a physical quantity with magnitude and a unit.
- A vector is a physical quantity with magnitude, a unit and a direction.

Graphical representation

- The length of the arrow represents the magnitude of the vector.
- The arrowhead indicates the direction of the vector.

Separation into components

Horizontal component = $F_x = F \cos\theta$
Vertical component = $F_y = F \sin\theta$

Separation in components: an object on a slope

Perpendicular component = $F_{g\perp} = F_g \cos\theta$
Parallel component = $F_{g\parallel} = F_g \sin\theta$

VECTORS IN TWO DIMENSIONS

Forces in equilibrium

- The resultant is zero
- The head to tail method results in a closed diagram.

Determining the resultant by using a scale diagram

- Head to tail method
- Tail to tail method:
 - Choose a scale
 - Draw the vectors to scale using one of the methods.
 - Draw and measure the resultant vector.

Determining the resultant with the use of components

- Determine each vector's x and y components.
- Add all the x components together algebraically.
- Add all the y components together algebraically.
- Calculate the resultant using Pythagoras.
- Determine the direction (bearing) of the resultant using $\tan\theta$.