

MOMENTS

KEY WORDS & DEFINITIONS

1. Moment

The turning effect of a force on a rigid body.

2. Resultant Moment

The sum of all moments acting on a rigid body.

3. The Point of Tilting

The instantaneous situation where the reaction at any support or the tension in any supporting string or wire, other than at the pivot, will be zero.

4. Coplanar Forces

Forces that act in the same plane.

5. Lamina

A 2D object whose thickness can be ignored.

MODELLING ASSUMPTIONS & IMPLICATIONS

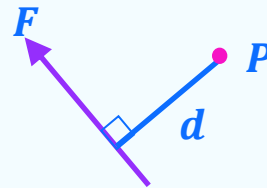
A plank is uniform \Rightarrow Weight acts at the centre of the plank

A plank is a rod \Rightarrow The plank remains straight

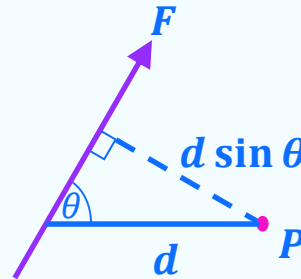
Any people/objects are particles \Rightarrow Their weight acts at the end of any rod

FORMULAE

Moment about P = magnitude of force x perpendicular distance of the force from P



Moment of F about P = $|F| \times d$ Nm clockwise



Moment of F about P = $Fd \sin \theta$ Nm clockwise

WHAT DO I NEED TO KNOW

1. The **units** of Moments are **Newton metres Nm**
2. The **direction** of the Moment (clockwise or anticlockwise) must be included with a moment's value.
3. When a rigid body is in **equilibrium**, the **resultant force** in any direction is **0N** and the **resultant moment** about any point is **0Nm**
- 4 The centre of mass of a **non-uniform rod** is **not necessarily** at the **midpoint** of the rod.