

Force

Chapter 1: Force · Topic 1

Key Concept

The moment of a force (torque) about a point equals force multiplied by the perpendicular distance from the point to the line of action of the force.

The principle of moments states that for a body in rotational equilibrium, the sum of clockwise moments equals the sum of anticlockwise moments.

The centre of gravity is the point where the entire weight of a body appears to act, important for understanding stability.

Understanding force and moments is essential for analysing simple machines, levers, and everyday situations involving rotation and balance.

Quick Revision Notes

- Moment of force = force $\times$ perpendicular distance.
- Also called torque.
- Principle of moments: clockwise = anticlockwise (equilibrium).
- Centre of gravity is where weight appears to act.
- It's important for stability.
- This applies to levers and simple machines.
- It explains everyday rotation and balance.
- Practice builds moment calculation skills.

Practice Questions

- 1 Calculate the moment of a 10N force at a distance of 2m.
- 2 Explain the principle of moments with an example.
- 3 Discuss the centre of gravity of a ruler.
- 4 Explain why a wider base increases stability.
- 5 Solve an equilibrium problem using the principle of moments.
- 6 Discuss a real-life example of moments (like a see-saw).