# A level Mathematics: Mechanics

| UNIT 4: Moments Forces' turning effects (9.1) | Teaching Time 5 Hours |
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## SPECIFICATION REFERENCES

**9.1** Understand and use moments in simple static contexts.

## PRIOR KNOWLEDGE

- Types of forces and force diagrams
- Assumptions made throughout this course (e.g. particle, rigid, light, etc.)
- Weight = mass × gravity ($W = mg$)
- S.I. units

GCSE (9-1) in Mathematics at Higher Tier

**A19** Solving linear and simultaneous equations

AS Mathematics – Mechanics content

**8.4** Basic equilibrium (See Unit 8a of the SoW)

## KEYWORDS

Moment, turning effect, sense, newton metre (N m), equilibrium, reaction, tension, rod, uniform, non-uniform, centre of mass, resolve, tilting, 'on the point', concurrent.

## NOTES

The guidance on the specification document states: 'Equilibrium of rigid bodies. Problems involving parallel and non-parallel coplanar forces, e.g. ladder problems.'

In this unit we will be considering only horizontal rod questions in which all the forces are parallel to one another (e.g. weight and normal reaction). This unit is therefore a simple way to also introduce the concepts of resolving and equilibrium (vertically only).

Unit 7a goes on to consider applications of moments, including for example ladder problems after resolving forces at any angle has been covered in Unit 5a.