



QUESTION WORKBOOK

Moments

Mechanics · Year 12–13

6 questions · 23 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

- A1** Define the moment of a force about a point, state its units, and explain the role of sense. [3]

- A2** An adult of weight 300 N sits 2 m from a seesaw's pivot. Find how far from the pivot a child of weight 200 N must sit on the other side to balance it. [3]

SECTION B · Standard

- B1** A uniform 6 m beam of weight 90 N rests on a support at its centre. A person of weight 450 N sits 1 m from the centre. Find where a 300 N weight must be placed on the other side to keep the beam horizontal. [3]

- B2** A uniform 8 m beam of weight 200 N rests horizontally on supports at 1 m and 6 m from one end. Find the reaction at each support. [5]

- B3** A non-uniform 10 m beam of weight 500 N rests on supports at its two ends, which carry reactions of 300 N and 200 N. Find how far the centre of mass lies from the end with the larger reaction. [3]

SECTION C · Stretch

- C1** A uniform rod AB of length 4 m and mass 12 kg rests horizontally on supports at A and at C, where $AC = 2.5$ m. A particle of mass m kg is placed at B. Find the greatest value of m for which the rod remains in equilibrium, and state the reaction at C at that instant. [6]