



JURONG PIONEER JUNIOR COLLEGE
8867 H1 PHYSICS

FORCES AND MOMENTS ASSIGNMENT

- 1 (a)** A truck of mass 39000 kg is stationary on a hill with a gradient of 15° . The three forces acting on the truck are its weight, a frictional force parallel to the road and a reaction force normal to the road.
- (i) Draw a triangle of forces to show that the truck is in equilibrium. Label each force. [2]

- (ii) Determine the numerical value of each of the three forces. [3]

- (b) A flat roof, shown in Fig. 1.1, of width 5.6 m between walls, is subjected to the following loading. The uniformly distributed weight of roof structure is 55 kN. The load placed on roof 1.6 m from wall A is 10 kN.

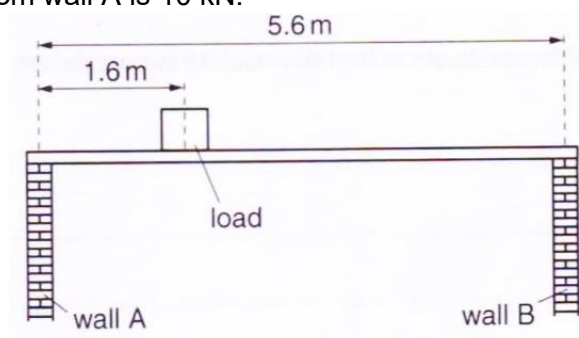


Fig. 1.1

Calculate the forces provided by each wall.

[4]

- 2 Fig. 2.1 shows a uniform metal beam pivoted at one end and held in equilibrium in a horizontal plane by a cable attached to its other end.

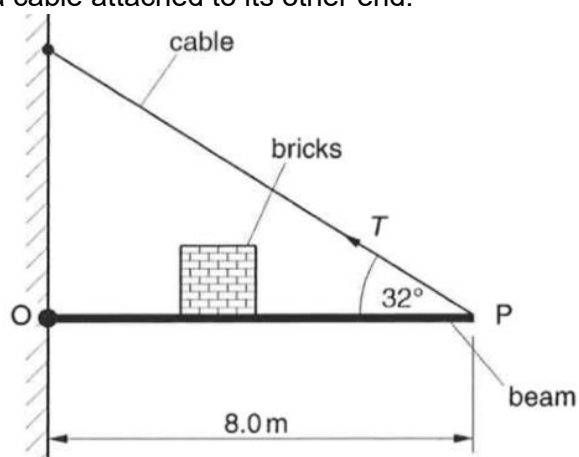


Fig. 2.1

The beam has mass 210 kg and length 8.0 m. The cable makes an angle of 32° to the beam and has tension T . A pile of bricks of total mass 150 kg is placed on the beam.

- (a) On Fig. 2.1, draw labelled arrows to show three other forces acting on the beam. [2]

(b) Describe and explain what would happen to the tension T in the cable as the pile of bricks is slowly moved towards the end P of the beam. [2]

(c) The pile is placed at a distance of 5.3 m from the end P. Calculate the tension T in the cable. [2]