



The end A of a non-uniform rod AB of length 0.6 m and weight 8 N rests on a rough horizontal plane, with AB inclined at 60° to the horizontal. Equilibrium is maintained by a force of magnitude 3 N applied to the rod at B . This force acts at 30° above the horizontal in the vertical plane containing the rod (see diagram).

- (i) Find the distance of the centre of mass of the rod from A . [2]

The 3 N force is removed, and the rod is held in equilibrium by a force of magnitude P N applied at B , acting in the vertical plane containing the rod, at an angle of 30° below the horizontal.

- (ii) Calculate P . [2]

In one of the two situations described, the rod AB is in limiting equilibrium.

- (iii) Find the coefficient of friction at A . [4]