

Applied Mathematics APM01A1, 2017

May 2, 2017

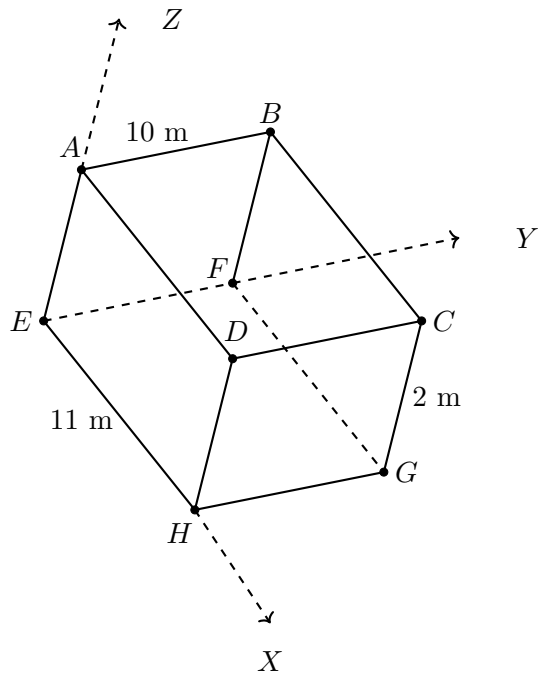
Tutorial 8

Question 1

A block with weight 50 N rests on a rough flat surface. The surface is required to be inclined by 60° from the horizontal. Calculate the coefficient of static friction μ_s the surface would need. If the surface is required to increase its incline, would you expect μ_s to increase or decrease?

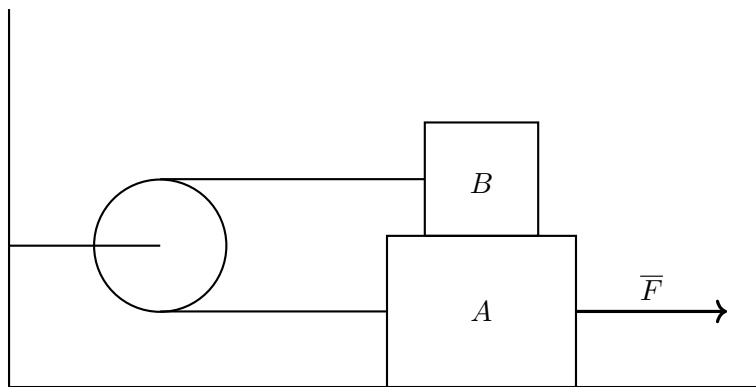
Question 2

In the figure below, a 100 N force is applied to the box at point C in the direction of point F . Calculate the moment generated by this force about point E .



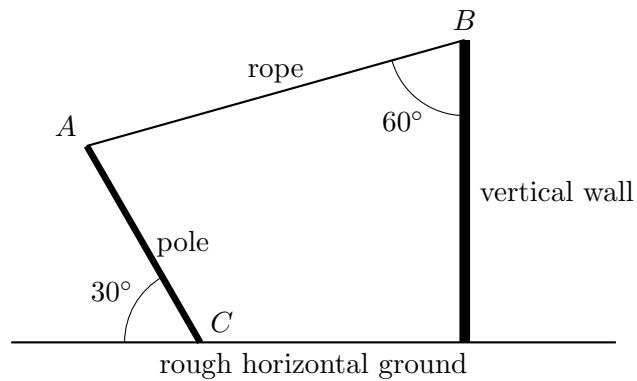
Question 3

In the figure below, let the weight of mass A be 2 N and the weight of mass B be 1 N . The coefficient of static friction μ_s is the same between all surfaces. Let the magnitude of force \bar{F} be 5 N . If the system is just about to start moving, calculate μ_s .



Question 4

The figure below shows an inclined uniform pole AC of weight 200 N held by a rope which is tied at A and B (all in the same vertical plane). The other end C of the pole rests on rough horizontal ground. **Hint:** One may model the weight of the pole as acting at its midpoint and directed straight downwards.



- 4.a) Calculate the tension in the rope.
- 4.b) Calculate the reaction force at point C in component form.