

12A

A uniform pole is propped between the floor and the ceiling of a room. The height of the room is 7.80 ft, and the coefficient of static friction between the pole and the ceiling is 0.576. The coefficient of static friction between the pole and the floor is greater than that. What is the length of the longest pole that can be propped between the floor and the ceiling?

12B

A uniform rod of weight  $F_g$  and length  $L$  is supported at its ends by a frictionless trough as shown in Figure P12.38. (a) Show that the center of gravity of the rod must be vertically over point  $O$  when the rod is in equilibrium. (b) Determine the equilibrium value of the angle  $\theta$ .

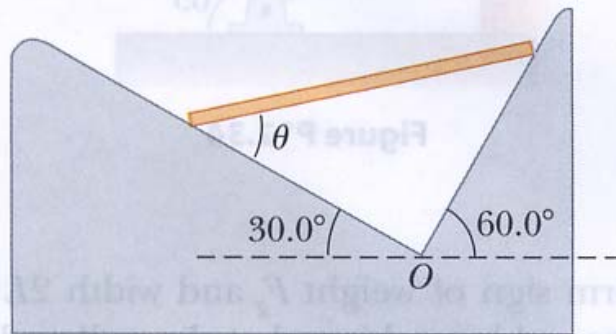


Figure P12.38

12C

● Figure P12.46 shows a vertical force applied tangentially to a uniform cylinder of weight  $F_g$ . The coefficient of static friction between the cylinder and all surfaces is 0.500. In terms of  $F_g$ , find the maximum force  $P$  that can be applied without causing the cylinder to rotate. As a first step, explain why both friction forces will be at their maximum values when the cylinder is on the verge of slipping.

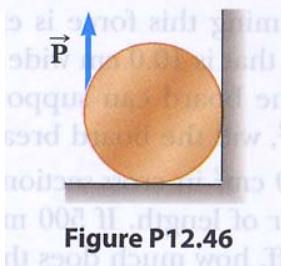


Figure P12.46