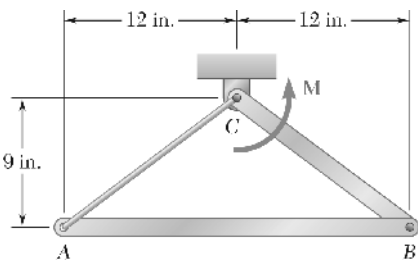


ME 104: Homework 9

Prof. Karl Hedrick: University of California, Berkeley

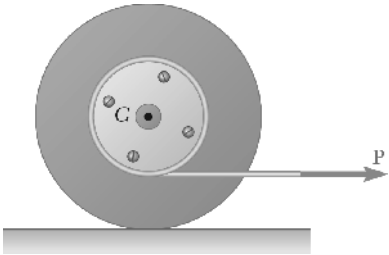
Due Monday, November 23rd

Chapter 16, Problem 88



An 8-lb slender rod AB and a 5-lb slender rod BC are connected by a pin at B and by the cord AC . The assembly can rotate in a vertical plane under the combined effect of gravity and a couple \mathbf{M} applied to rod BC . Knowing that in the position shown the angular velocity of the assembly is zero and the tension in cord AC is equal to 6 lb, determine (a) the angular acceleration of the assembly, (b) the magnitude of the couple \mathbf{M} .

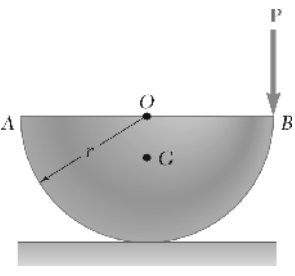
Chapter 16, Problem 100



A diagram showing a disk of 8-in. radius with a drum of 4-in. radius attached to its center. The disk and drum are on a horizontal surface. A force \mathbf{P} is applied to the drum, pulling it to the right. The center of mass is labeled G .

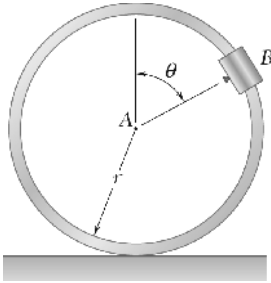
A drum of 4-in. radius is attached to a disk of 8-in. radius. The disk and drum have a combined weight of 10 lb and a combined radius of gyration of 6 in. A cord is attached as shown and pulled with a force \mathbf{P} of magnitude 5 lb. Knowing that the coefficients of static and kinetic friction are $\mu_s = 0.25$ and $\mu_k = 0.20$, respectively, determine (a) whether or not the disk slides, (b) the angular acceleration of the disk and the acceleration of G .

Chapter 16, Problem 111



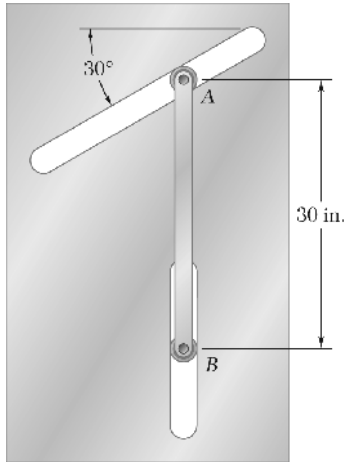
A half section of a uniform cylinder of mass m is at rest when a force \mathbf{P} is applied as shown. Assuming that the section rolls without sliding, determine (a) its angular acceleration, (b) the minimum value of μ_s compatible with the motion.

Chapter 16, Problem 113



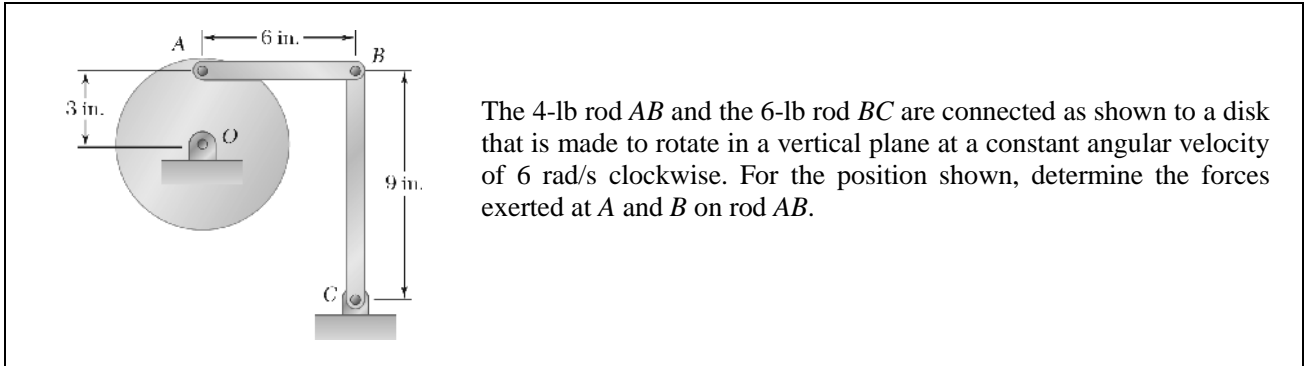
A small clamp of mass m_B is attached at B to a hoop of mass m_h . The system is released from rest when $\theta = 90^\circ$ and rolls without sliding. Knowing that $m_h = 3m_B$, determine (a) the angular acceleration of the hoop, (b) the horizontal and vertical components of the acceleration of B .

Chapter 16, Problem 119



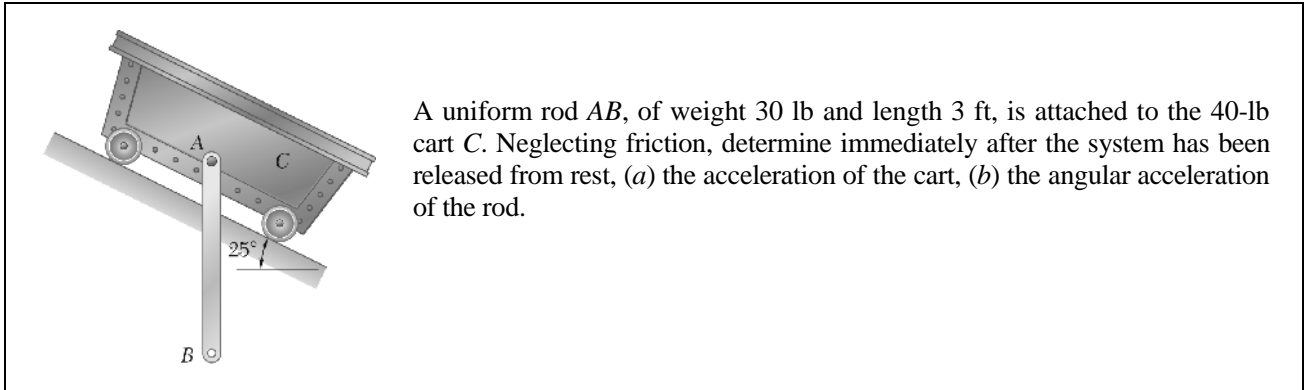
The motion of the 8-lb uniform rod AB is guided by small wheels of negligible weight that roll along without friction in the slots shown. If the rod is released from rest in the position shown, determine immediately after release (a) the angular acceleration of the rod, (b) the reaction at B .

Chapter 16, Problem 136



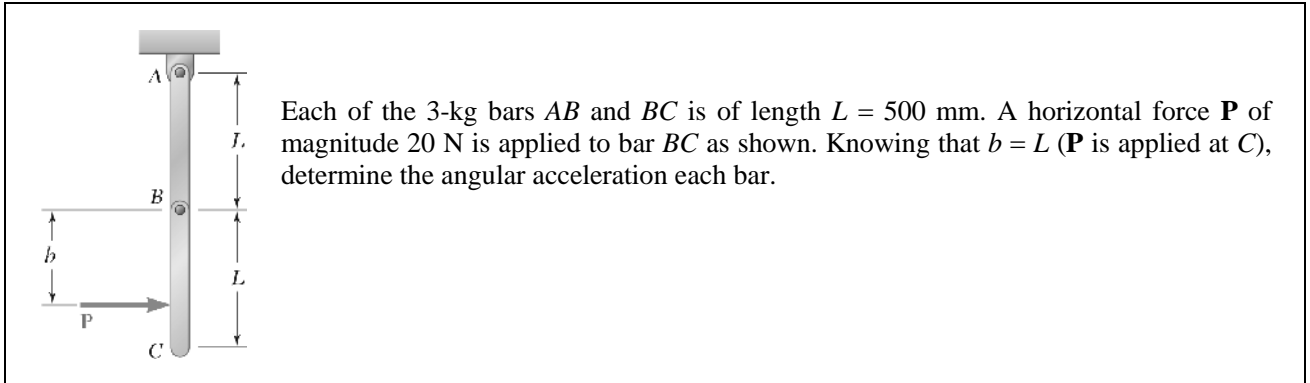
The 4-lb rod AB and the 6-lb rod BC are connected as shown to a disk that is made to rotate in a vertical plane at a constant angular velocity of 6 rad/s clockwise. For the position shown, determine the forces exerted at A and B on rod AB .

Chapter 16, Problem 144



A uniform rod AB , of weight 30 lb and length 3 ft, is attached to the 40-lb cart C . Neglecting friction, determine immediately after the system has been released from rest, (a) the acceleration of the cart, (b) the angular acceleration of the rod.

Chapter 16, Problem 149*



Each of the 3-kg bars AB and BC is of length $L = 500$ mm. A horizontal force \mathbf{P} of magnitude 20 N is applied to bar BC as shown. Knowing that $b = L$ (\mathbf{P} is applied at C), determine the angular acceleration each bar.