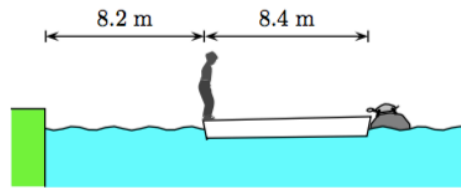
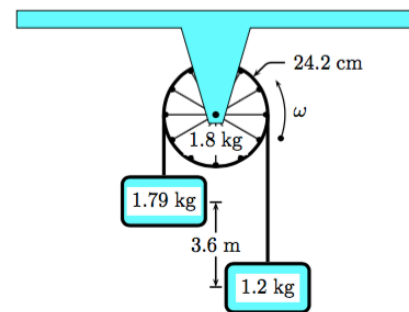


Physics II Placement Exam

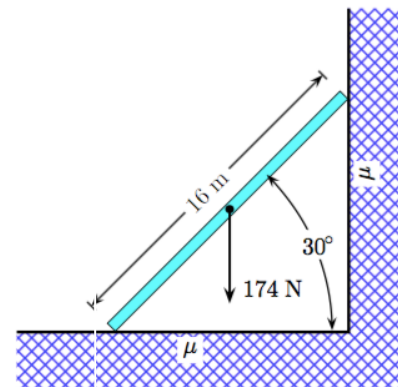
- 1) A 56 kg boat that is 8.4 m long is initially 8.2 m from the pier. A 33 kg child stands at the end of the boat closest to the pier. The child walks to the opposite end of the boat to examine a turtle. How far is the child from the end of the pier when she reaches the far end of the boat? Assume there is no friction between the boat and water.



- 2) An Atwood machine is constructed using a hoop with spokes of negligible mass. The 1.8 kg mass of the pulley is concentrated on its rim, which is a distance 24.2 cm from the axle. The mass on the right is 1.2 kg and the one on the left is 1.79 kg. What is the magnitude of linear acceleration of the hanging masses? The acceleration of gravity is 9.9 m/s^2 .



- 3) A uniform ladder weighing 174 N is leaning against a wall. The ladder slips when its angle between horizontal and the wall is 30° . Assuming the coefficients of static friction at the wall and the ground are the same, obtain a value for μ_s . The acceleration of gravity is 9.8 m/s^2 .



- 4) A metal object is suspended from a spring scale. The scale reads 859 N when the object is suspended in air and 777 N when the object is completely submerged in water. What is the volume of the object assuming the acceleration of gravity is 9.8 m/s^2 .

- 5) A 7 kg object moving with a speed of 8.8 m/s collides with a 16 kg object moving with a velocity of 8.3 m/s in a direction 20° from the initial direction of motion of the 7 kg object. What is the speed of the two objects after the collision if they remain stuck together?

