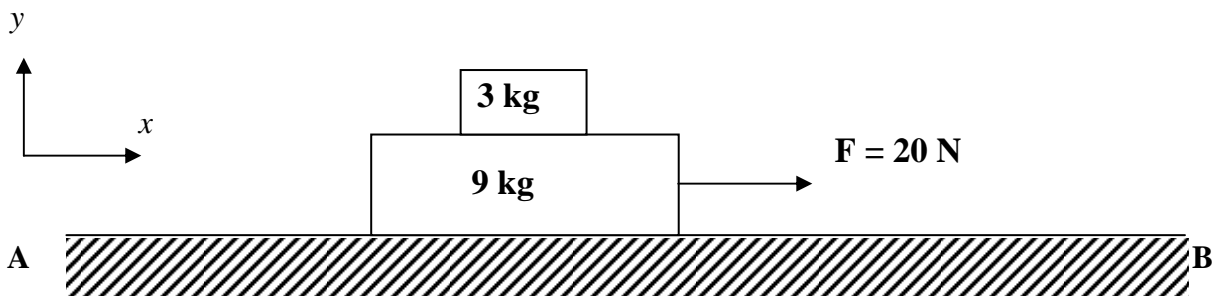
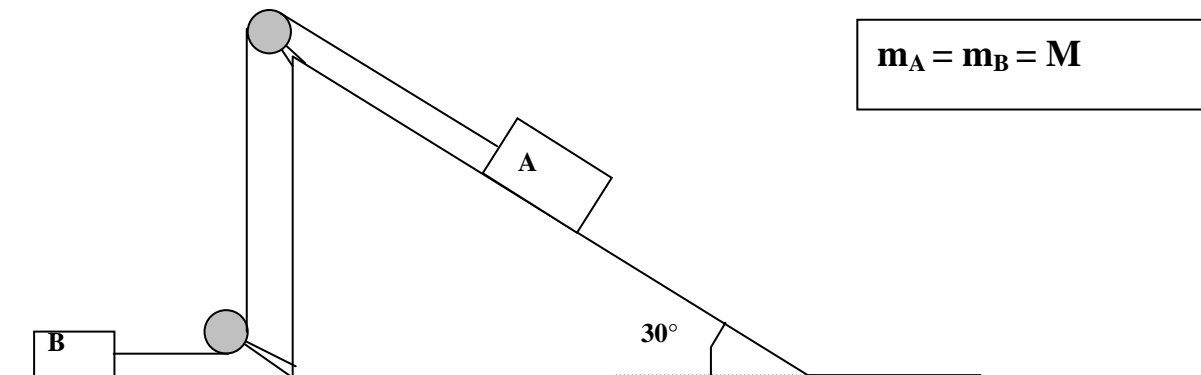


Help Session 1- (Fuad Enaya) 13/10/2004

1. A 2.0 kg mass has a velocity of $(2.0 \mathbf{i} + 2.0 \mathbf{j})$ m/s at one instant. Four seconds later its velocity is $(2.0 \mathbf{i} + 14 \mathbf{j})$ m/s. Assuming that the object is under the influence of a single constant force, find this force. $[(6.0 \mathbf{j})\text{N}]$
2. An object is hung from a spring balance attached to the ceiling of an elevator. The balance reads 70 N when the elevator is at rest. What is the reading of the spring balance when the elevator is moving upwards with an acceleration of $4.9 \text{ m}/(\text{s}^2)$? $[105 \text{ N}]$
3. A 3.0 kg block is placed on top of a 9.0 kg block as shown in Fig. A horizontal force $F = 20 \mathbf{i}$ N is applied to the 9.0 kg block, which slides on the frictionless surface AB. Assuming that the 3.0 kg block does not slip, find the frictional force exerted by the 9.0 kg block on the 3.0 kg block. $[5.0\mathbf{i} \text{ N}]$



4. Two blocks, of equal mass $= M$, rest on frictionless surfaces, as shown in Fig. Assuming the pulleys to be light and frictionless, calculate the time required for block A to move 0.5 m down the plane, starting from rest. $[0.64 \text{ s}]$



5. Consider a particle in motion while the net external force on it is zero. Which of the following statements is CORRECT in this case?

A1 The particle must be moving at a constant velocity.

A2 The particle must be moving at a constant speed in a circle.

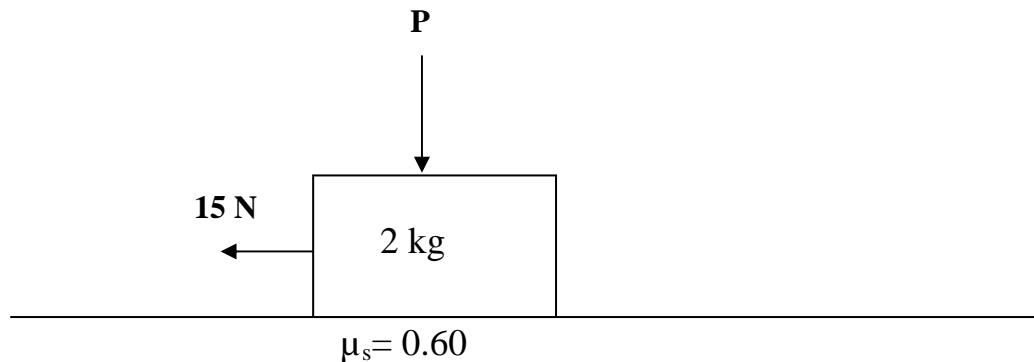
A3 The particle will come to rest after some time.

A4 The velocity of the particle is always perpendicular to

A4 the direction of the motion.

A5 The particle has an acceleration of $9.8 \text{ m / (s}^2\text{)}$.

6. A 2.0 kg block is initially at rest on a horizontal surface. A 15 N horizontal force and a vertical force P are applied to the block as shown in Fig. If the coefficient of static friction for the block and the surface is 0.60, what is the magnitude of force P that makes the block start moving? [5.4 N]



7. A 0.50 kg ball tied to the end of a string 100 cm in length swings in a vertical circle with a constant speed of 9.2 m/s. What is the tension in the string when the ball is at the bottom of the circle? [47 N]

8. A bicyclist travels in a 50 m radius-circular horizontal road. Find his maximum speed without slipping if the coefficient of static friction between the bicycle and the road is 0.25.[11 m/s]