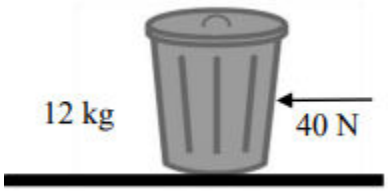
PENANG SANGAM HIGH SCHOOL
YEAR 13 PHYSICS
WEEK 2
Dates: (07/06/21) to (11/06/21)

WORKSHEET: 2

1) A dustbin of mass 12 kg standing on horizontal ground is pushed by a horizontal force of 40 N.

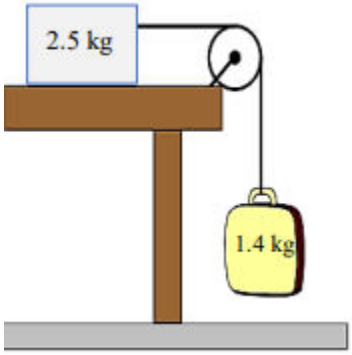


If the coefficient of friction is 0.4,

a) determine the frictional force.

b) will the dustbin move?

2) One end of a light inextensible string is attached to a tool box of mass 2.5 kg which is lying on a horizontal table. The string passes over a smooth pulley and is tied at the other end to a bag of mass 1.4 kg.

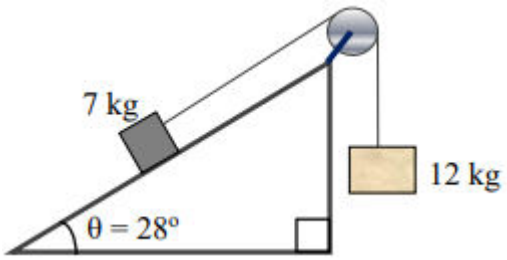


a) Draw a diagram showing the forces acting on the tool box.

b) If the tool box is just on the point of sliding, find a value for μ, the coefficient of friction.

3) The coefficient of friction between a load of sand and the tray of a truck in which it carries is 0.8. At what angle to the horizontal does the truck tray have to be tilted before the sand starts to slide out?

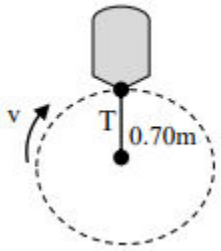
4) Find the acceleration experienced by each of the two objects shown below, if the coefficient of kinetic friction between the 7 kg object and the plane is 0.25



What will be the Tension in the string.

5. A bucket of water with a mass of 0.80 kg is swung about in a vertical circle by a string 0.70 m long as shown in the diagram. The speed of the bucket varies as it travels around the circle.

a) Determine the minimum speed of the bucket in order to maintain it in a circular orbit.
b) Calculate the tension in the string when the bucket is at the top of the circle.



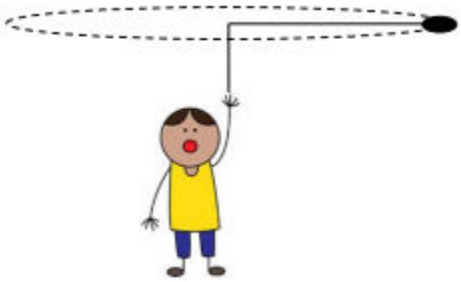
6. The London Eye is one of the largest Ferris wheels on earth. It has a diameter of 120 m and rotates at a rate of about 1 complete rotation per 30 minutes. Given that it moves at a constant speed, find the:

a) centripetal force on a passenger of mass 65 kg

b) reaction force from the seat when the passenger is at the top of the circle

7) A boy is playing swing ball with a ball of mass 0.25 kg as shown in the Figure . At one particular time, the ball travels at 2rev/s in a horizontal circle of radius 0.4 m

Calculate the:
a) speed of the ball
b) centripetal force.
c) tension in the string.



8) A car rounds an unbanked curve (radius = 92 m) without skidding at a speed of 26 ms^{-1}.
What is the smallest possible coefficient of static friction between the tires and the road?