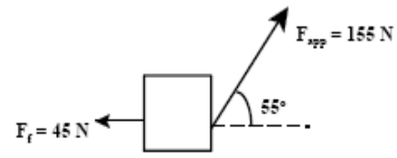
Physics 3204
Assignment 3
(Outcome325-8)

Name:_____

1 What is the magnitude of the net horizontal force acting on the object below?

(A) 44 N
(B) 82 N
(C) 110 N
(D) 130 N



2 What is the force of friction on a 10.0 kg object sliding at a constant speed along a horizontal surface if $\mu_k = 0.250$?

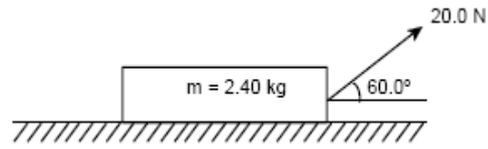
(A) 2.50 N
(B) 24.5 N
(C) 97.8 N
(D) 392 N

3 What is the frictional force for a 24 kg object on a horizontal surface if $\mu_k = 0.25$?

(A) 6.0 N
(B) 24 N
(C) 59 N
(D) 96 N

4 What is the normal force in the diagram below?

(A) 6.20 N
(B) 10.0 N
(C) 13.2 N
(D) 23.5 N

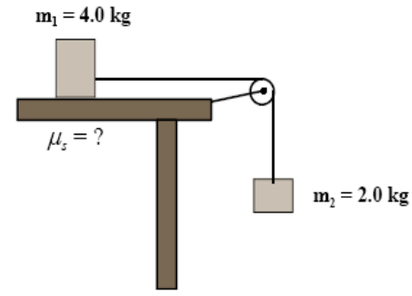


5 A box is pulled on a smooth horizontal floor with a 1.00×10^2 N force, at 37.0^o above the horizontal. If the mass of the box is 40.0 kg, what is the normal force?

(A) 292 N
(B) 312 N
(C) 332 N
(D) 393 N

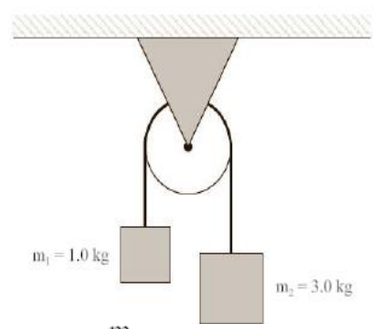
6 In the diagram at the right, two masses are connected by a light string over a frictionless massless pulley. What coefficient of static friction is required to keep m_1 from slipping?

(A) 0.33
(B) 0.50
(C) 0.67
(D) 2.0



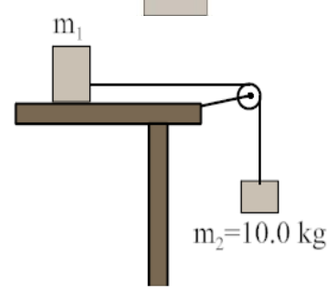
7 In the diagram below, two objects are suspended from the ends of a massless string passing over a frictionless pulley. What is the magnitude of the acceleration of these masses?

(A) 2.5 m/s^2
(B) 4.9 m/s^2
(C) 7.4 m/s^2
(D) 9.8 m/s^2



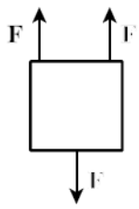
8 In the diagram below, the tension in the string joining the two masses is 12.0 N. If friction is negligible, what is the mass of m_1?

(A) 1.10 kg
(B) 1.40 kg
(C) 2.00 kg
(D) 10.0 kg

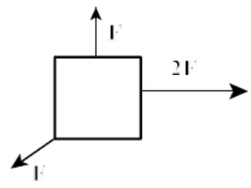


9 For which free body diagram is $\boldsymbol{F_{Net} = 0}$?

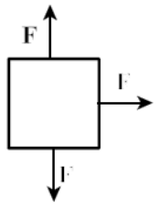
(A)



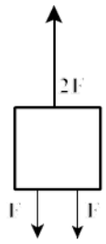
(C)



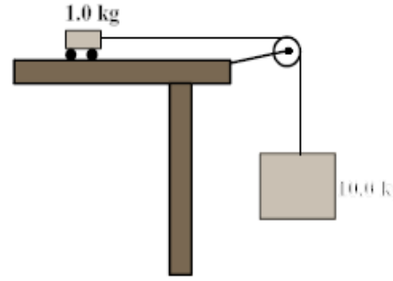
(B)



(D)

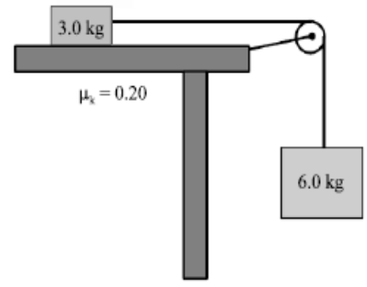


10 The diagram below shows a 1.0 kg cart connected to a 10.0 kg mass. Assuming the surface is frictionless, what is the acceleration of the system if the net force is 98.0 N?



(A) 8.9 m/s^2
(B) 9.8 m/s^2
(C) 11 m/s^2
(D) 98 m/s^2

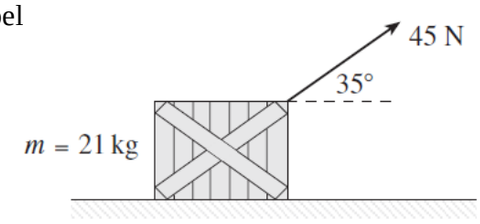
11 What is the acceleration of the system shown in the diagram to the right?



(A) 5.9 m/s^2
(B) 6.5 m/s^2
(C) 8.8 m/s^2
(D) 9.8 m/s^2

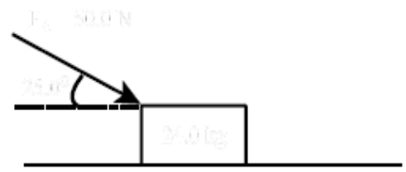
12 A 21 kg crate is hauled across the floor with a 45 N force directed at an angle of 35° above the horizontal.

A) Draw a free body diagram for the box. Clearly label **ALL** forces.



B) What is the acceleration of the crate?

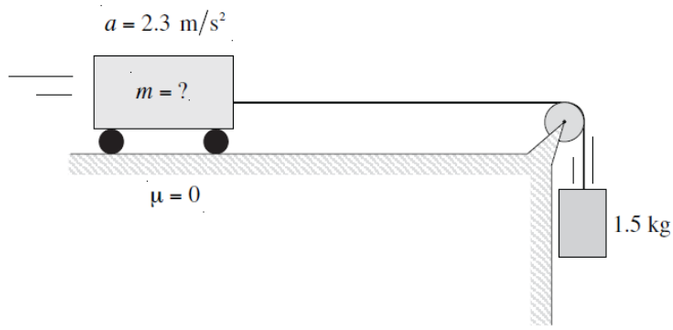
13 In the diagram below, a 24.0 kg box is pushed at a 25.0° angle with an applied force of 50.0. The coefficient of kinetic friction is 0.100.



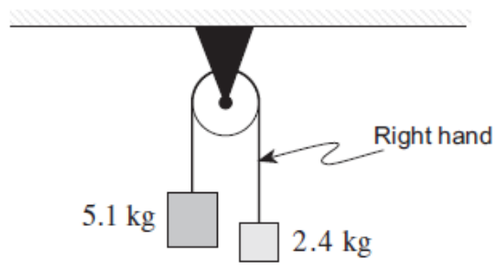
(A) Draw a free body diagram for the box. Clearly label **ALL** forces.

(B) What is the acceleration of the box?

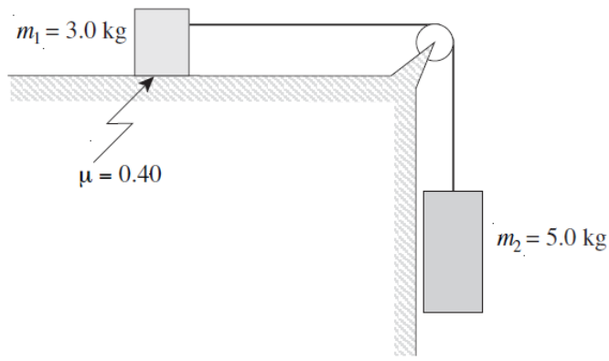
14 A light cord connects a moving cart to a mass over a pulley as shown. If the cart is accelerating at 2.3 m/s^2, what is the mass of the cart?



15 A frictionless pulley is set up with two hanging masses as shown below. What is the tension in the right hand rope while the masses move freely?



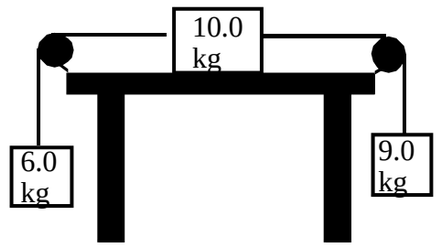
16 Two masses are connected by a light cord over a frictionless pulley as shown below. The masses are initially held at rest by students conducting a dynamics lab.



(a) Determine the acceleration of the system.

(b) What is the tension in the cord?

17. Three blocks with masses 6.0 kg, 9.0 kg and 10.0 kg are connected as shown in the diagram. The coefficient of kinetic friction between the 10.0 kg block and the table is 0.20.



(a) Find the acceleration of the system. (Draw an FBD)

(b) Find the tension in the cord on the left and on the right. (Draw a FBD)