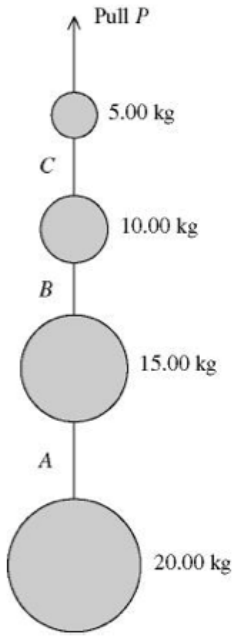
A series of weights connected by very light cords are given an upward acceleration of 4.00 m/s^2 by a pull P, as shown in the figure. A, B, and C are the tensions in the connecting cords. The pull P is closest to

a. 690 N.
b. 490 N.
c. 290 N.
d. 200 N.
e. 50 N.



A ball hits a wall, it reverses direction then

a. The force of the ball on the wall = the force of the wall on the ball.
b. The force of the ball on the wall > the force of the wall on the ball.
c. The force of the ball on the wall < the force of the wall on the ball.
d. The force of the wall on the ball is zero.
e. None of the above.

As a car goes up a hill, there is a force of friction between the road and the tires rolling on the road. The maximum force of friction is equal to:

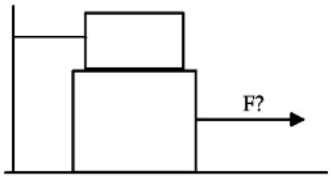
a. the weight of the car times the coefficient of friction.
b. the normal force of the road times the coefficient of friction.
c. the mass of the car times the coefficient of friction.
d. zero
e. None of the above

Two equal-mass rocks tied to string are whirled in horizontal circles. The radius of circle 2 is twice that of circle 1. If period of motion is the same for both rocks, what is the tension in cord **2** compared to cord **1**

a. $T_2 = \frac{1}{4} T_1$
b. $T_2 = \frac{1}{2} T_1$
c. $T_2 = T_1$
d. $T_2 = 2T_1$
e. $T_2 = 4T_1$

A 4.00-kg block rests between the floor and a 3.00-kg block as shown in the figure. The 3.00-kg block is tied to a wall by a horizontal rope. If the coefficient of static friction is 0.800 between each pair of surfaces in contact, what force must be applied horizontally to the 4.00-kg block to make it move?

A) 16.2 N B) 54.9 N C) 21.1 N D) 23.5 N E) 78.5 N



5) A Karwa taxi and a Karwa bus are driving at speeds of 64.8 km/h for the car, and 68.4 km/h for the bus. They approach a frictionless roundabout and take a path of radius 119 m. If the roundabout is banked at angle of 16° with the horizontal, then what will happen to both vehicles?

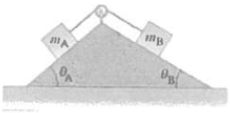
A) The Bus will skid, but the car will not.
B) The car will skid, but the bus will not.
C) Since skidding does not depend on the mass of the vehicle, both will not skid.
D) Since there is no friction, both will skid.
E) Cannot determine the answer because we do not know the masses of the vehicles

Problems

~~Show the solutions to problems showing all the steps of your solution.~~ 16

Problem 1: The masses m_A and m_B slide on the smooth (frictionless) inclines fixed as shown in Fig. B–1. (*a*) Determine a formula for the acceleration of the system in terms of m_A, m_B, θ_A, θ_B and g (2 marks). (*b*) If $\theta_A = 32^\circ$ and $\theta_B = 23^\circ$ and $m_A = 5.0$ kg, what value of m_B would keep the system at rest (1 mark)? What would be the tension in the cord (negligible mass) in this case (1 mark)? (*c*) What ratio, m_A/m_B, would allow the masses to move at constant speed along their ramps in either direction (1 mark)?

Fig.B-1



Block A in the following figure has a mass of 4.00 kg, and block B has a mass of 12.0 kg. The coefficient of kinetic friction between block B and the horizontal surface is 0.25. Block B is speeding up to the right with an acceleration of 2.00 m/s^2.

a) Draw free body diagram for the three blocks
b) What is the tension between bock A and B?
c) What is the tension between block B and block C?
d) What is the mass of block C?