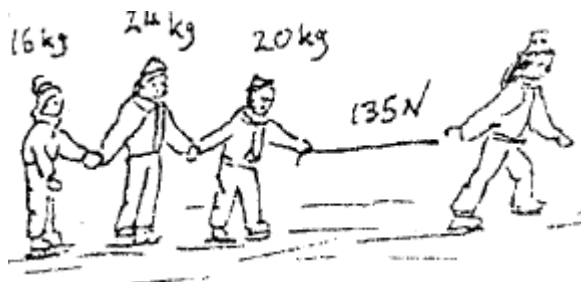


1. A volleyball player is sliding across the gym floor with an initial speed of 3.0 m/s. If the player stops after sliding 2.0m, what is the coefficient of friction between the floor and the player?
2. In a cold country, on a cold morning black ice covers a road so that the coefficient of friction between tires and the icy road surface is only 0.08. What is the incline that a vehicle with 4-wheel drive could climb with zero acceleration?
3. Two boxes of masses 12kg and 10kg are resting on a surface and connected by a lightweight cord. The coefficient of friction between the boxes and the surface is 0.15. Calculate (a) the acceleration of each box
(b) the tension in the cord.
4. A 5.0 kg mass rests on a level, frictionless table attached to a 3.0kg mass by a light string that passes over a frictionless pulley. Calculate the tension in the string when the masses are released.
5. Three small children of masses 20.0kg, 24.0kg and 16.0kg hold hands, and are pulled across a frozen pond by a larger XI grade student. The student pulls on the rope with a force of 135N. Calculate
 - a) the acceleration of the XI grade student.
 - b) The force that each pair must hold to ensure that the chain is not broken.



6. A 1.5×10^3 kg car travelling at 44m/s collides head-on with a 1.0×10^3 kg car travelling 22m/s in the opposite direction. If the cars stick together on impact, what is the velocity of the wreckage immediately after the impact?

7. What (a) impulse and (b) average force must be imparted to a 100g baseball to change its velocity from 40.0m/s to -50.0m/s in 1.00 ms?

8. A frictionless disc of mass 0.50kg is moving in a straight line across an air table at a speed of 2.4 m/s when it bumps into an elastic band stretched between two fixed posts. If the elastic band exerts an average opposing force of 1.2N on the disc for 1.5s, what will be the final velocity of the disc?

9. Water leaves a hose at a rate of 5.0kg/s with a speed of 50m/s. It strikes a wall, which stops it. (Ignore any splashing). What is the force exerted by the water on the wall?

10. A 60kg prisoner wishes to escape from a third-story window by going down a rope made of bed-sheets tied together. The can only sustain a maximum tension of 500N.(take $g=9.8\text{ms}^{-2}$)
 - a) How fast must the prisoner accelerate down the rope if it is not to break?
 - b) Why should he have not slide down the rope at a constant velocity?