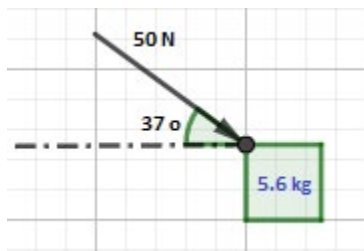


1. Draw the free body diagram of an empty wooden box on wheels being pushed by John with a force of 22 N in an eastward direction and by Syed with a force of 19 N in a westward direction. Indicate the direction and magnitude of the net force on the free body diagram. If the wooden box was not on wheels what would be a factor in the calculation of net force? What would be the result if both guys were using equal force in opposite directions?
2. In *Question 3* there is a force acting downwards due to the weight of the box. Since the box is not moving downwards into the ground what other force is acting on the box? If the box weighs 5 kg and both John and Syed are exerting 50 N each downwards on the box, what is the magnitude of this upward force?

Basic Frictionless Forces, Net Force and Acceleration

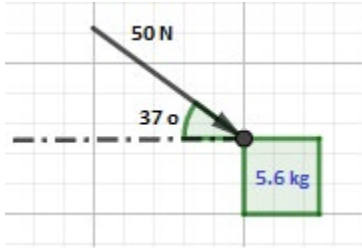
1. A body of mass 4 kg is accelerating on a frictionless surface due to an eastward applied force of 45 N. Calculate the acceleration of the body.
2. Travis and Ryan are pushing a plastic box of mass 13 kg in opposite directions. If Tavis exerts 65 N of force eastward and the box accelerates by 0.37 m/s^2 eastward, how much force is Ryan exerting?
3. Calculate the mass of a truck tire that is accelerating at a rate of 0.22 m/s^2 after being rolled by Dean with a force of 70 N.
4. Calculate the acceleration of the object below. (Neglect friction)



Friction

1. Debbie is pushing her laundry basket with an 8 N force to her washer dryer. If the basket has a mass of 2.8 kg, calculate the acceleration of the basket. $\mu_k = 0.22$
2. If a hockey puck of mass 170 g is decelerating across an ice ring at 0.9 m/s^2 after being hit, determine the μ_k of the contact between the puck and the ice.
3. A 0.5 kg object is accelerating from an applied force of 2N. If $\mu_k = 0.3$, determine the net force. Also, determine the acceleration of the object.
4. If the coefficient of static friction (μ_s) between a flower pot and the floor is 0.65, what mass should the pot be less than for an applied force of 20 N to move it?

5. Consider the diagram from *Question 4* in *Basic Frictionless Forces*. Calculate the acceleration if $\mu_k = 0.44$.



6. A wooden box of mass 1.5 kg is accelerating at a rate 0.88 m/s over a rough surface with $\mu_k = 0.7$. Determine:
- The horizontal applied force on the wooden box.
 - The applied force if it was exerted at a 40° angle to the horizontal

Inclined Plane

- A crate of mass 13 kg is sliding down a 39° angle ramp. What is the acceleration of the crate? $\mu_k = 0.45$
- If a brick of mass 0.56 kg was placed on a 20° angle inclined plane. Would it slide down if $\mu_s = 0.3$?
- A 14 kg wooden box is accelerating at 2.8 m/s^2 down a 30° angle ramp. Determine the coefficient of kinetic friction between the wooden box and the surface.
- Determine the angle of the following inclined plane:
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