1. What is the magnitude of the largest net force that can be produced by combining a force of 6.0 N and a force of 8.0 N? What is the magnitude of the smallest such force?

2. Two friends grab different sides of a videotape cartridge and pull with forces of 3.0 N to the east and 4.0 N to the south, respectively. What force would a third friend need to exert on the cartridge in order to balance the other two forces? What would be that force's precise direction?

3. A four-way tug-of-war has four ropes attached to a metal ring. The forces on the ring are as follows: F1=4 000 N east, F2=5 000 N north, F3=7 000 N west, and F4=9 000 N south. What is the net force on the ring? What would be that force's precise direction?

4. A child pulls a toy by exerting a force of 15.0 N on a string that makes an angle of 55.0° with respect to the floor. What are the vertical and horizontal components of the force?

5. A shopper pushes a grocery cart by exerting a force on the handle. If the force equals 76 N at an angle of 40.0° below the horizontal, how much force is pushing the cart in the forward direction? What is the component of force pushing the cart against the floor?

6. Two paramedics are carrying a person on a stretcher. One paramedic exerts a force of 350 N at 58° above the horizontal and the other paramedic exerts a force of 410 N at 43° above the horizontal. What is the magnitude of the net upward force exerted by the paramedics?

7. A certain cable of an elevator is designed to exert a force of 45 000 N. If the maximum acceleration that a loaded car can withstand is 3.5 m/s^2 (the current fastest elevators in the world undergo an acceleration of less than 3.2 m/s^2),what is the combined mass of the car and its contents?

8. An 2.0-kg fish pulled upward by a fisherman rises 1.9 m in 2.4 s,starting from rest. Assuming the acceleration is constant,find the magnitude and direction of the net force acting on the fish during this interval.

9. An 8.0-kg bag of coins is being pulled upward by a rope rises 20.0 cm in 0.50s ,starting from rest. Assuming the acceleration is constant, calculate the net force on the bag. What is the upward force on the bag exerted by the rope?

10. A pedestrian with a mass of 75 kg accelerates at 0.15 m/s^2 to the west. A high wind comes up,blowing toward the east. The wind is capable of giving the pedestrian an acceleration of 0.02 m/s^2. What are the magnitude and direction of the net force acting on the pedestrian?

11. Assume that a catcher in a professional baseball game exerts a force of −65.0 N to stop the ball. Ifthe baseball has a mass of 0.145 kg, what is its net acceleration as it is being caught?

12. The Goliath beetle,which is found in Africa,can reach a mass of 0.080 kg. Suppose a Goliath beetle is placed on a slope that makes an angle of 37.0° with the horizontal. Find the acceleration of the beetle along the slope,assuming the slope to be frictionless.

13.A blue whale with a mass of 190 000 kg was caught in 1947. What is the magnitude of the minimum force needed to move the whale along a horizontal ramp if the coefficient of static friction between the ramp's surface and the whale is 0.460?

14.Until 1979,the world's easiest driving test was administered in Egypt. To pass the test,one needed only to drive about 6 m forward,stop,and drive the same distance in reverse. Suppose that at the end of the 6 m the car's brakes are suddenly applied and the car slides to a stop. If the force required to stop the car is 6 000 N and the coefficient of kinetic friction between the tires and pavement is 0.77,what is the magnitude of the car's normal force? What is the car's mass?

15.The heaviest train ever pulled by a single engine was over 2 km long. Suppose a force of 1.13×10^8N is needed to overcome static friction in the train's wheels. If the coefficient of static friction is 0.741,what is the train's mass?

16.A passenger with a mass of 60.0 kg is standing in a subway car that is accelerating at 3.70 m/s^2. If the coefficient of static friction between the passenger's shoes and the car floor is 0.455,will the passenger be able to stand without sliding?

17.A 90.0 kg skier glides down a slope with an incline of 17.0°. What frictional force is needed for the skier to move at a constant velocity?

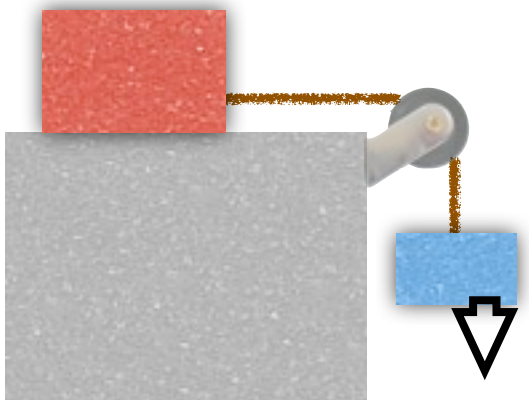
18.A dogsled with a mass of 47 kg is loaded with 33 kg of supplies. If the coefficient of kinetic friction between the sled's runners and the snow is 0.075,what is the magnitude of the frictional force on the sled as it moves across flat ground? What is the magnitude of the frictional force on the sled as it moves up a hill with a 15° incline?

In the diagram below, a 15 kg mass rests on a frictionless table and 30 kg mass is connected by a rope over a frictionless pulley.

Find the acceleration of the masses.

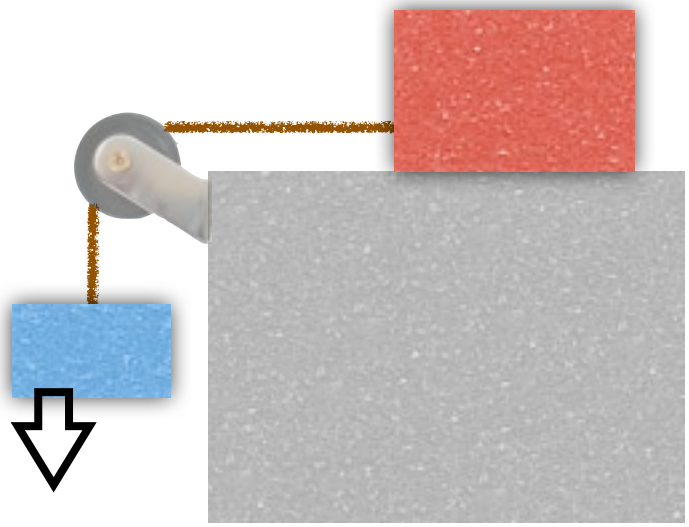
Find the tension in the rope.

Find the time required for the blocks to slide 3m.



In the diagram below, a 75 kg mass rests on a table and 40 kg mass is connected by a rope over a frictionless pulley. The coefficient of kinetic friction between the box and the table is 0.1. The coefficient of static friction is 0.15.

Find the acceleration of the masses.
Find the tension in the rope.
Find the time required for the blocks to slide 3m.



The picture shows an 18 kg mass hanging from a spring scale in an elevator.

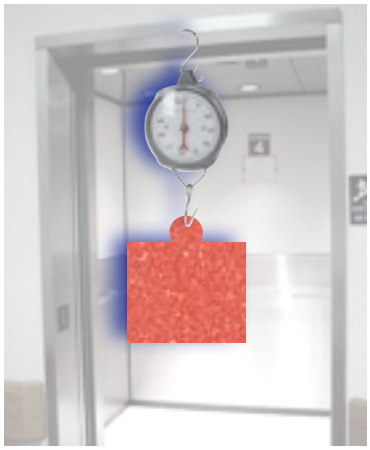
Find the apparent weight of the block when;

a) The elevator is not moving.

b) The elevator is accelerating upwards at 5.2 m/s^2.

c) The elevator slows down at 1.8 m/s^2.

d) The elevator rope breaks.



In the diagram below, a 36 kg block is pulled by a force of 250 N at an angle of 25°. The block rests on a table with a 0.18 coefficient of kinetic friction.

Label and solve for all forces.
What is the acceleration of the block?
How long would it take to move the block 14m?