

Spring-2018 Phys101
Assignment 4

Please check MateringPhysics for other problems

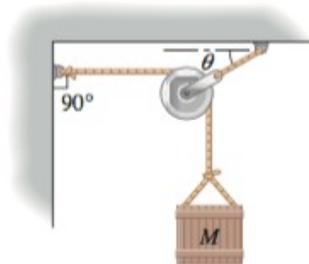
Due date: 7 March. 2018.

Discussion questions

- 1- A ball thrown straight up has zero velocity at its highest point. Is the ball in equilibrium at this point? Why or why not?
- 2- Some people say that the “force of inertia” (or “force of momentum”) throws the passengers forward when a car brakes sharply. What is wrong with this explanation?
- 3- A manual for student pilots contains the following passage: “When an airplane flies at a steady altitude, neither climbing nor descending, the upward lift force from the wings equals the airplane’s weight. When the airplane is climbing at a steady rate, the upward lift is greater than the weight; when the airplane is descending at a steady rate, the upward lift is less than the weight.” Are these statements correct? Explain.

Problems

- 4- An advertisement claims that a particular automobile can “stop on a dime.” What net force would actually be necessary to stop a 850-kg automobile traveling initially at 45.0 km/h in a distance equal to the diameter of a dime, which is 1.8 cm?
- 5- A pulley is hung from the ceiling by a rope. A block of mass M is suspended by another rope that passes over the pulley and is attached to the wall. The rope fastened to the wall makes a right angle with the wall. Neglect the masses of the rope and the pulley.
Find (a) the tension in the rope from which the pulley hangs and (b) the angle θ that the rope makes with the ceiling.



- 6- Two objects with masses of 3.00 kg and 5.00 kg are connected by a light string that passes over a frictionless pulley, as in the figure below. Determine (a) the tension in the string, (b) the acceleration of each object, and (c) the distance each object will move in the first second of motion if both objects start from rest.

