OLD EXAMS

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hangs in the ordinary way by a cord attached to the screw eyes, and passing over a smooth block. The screw eyes are thirty-six inches apart, and the cord is six feet long. What is the location of the cord?

Find the center of gravity of a bolt one-half inch in diameter and six inches long under the head; the bolt is in a brick cube.

An aeroplane moving at the speed of 75 miles per hour in still air at the height of three thousand feet drops a bomb upon a target. Neglecting air friction, find the horizontal distance between the aeroplane and the target at the moment the bomb is released. How would air friction modify your answer? Derive the equation of the path of the bomb.

The emergency chutes in the famous Great Lakes ships will stop a 10,000-ton vessel moving four miles an hour in a distance of seventy feet. If the average force exerted is 5,000,000 lbs., what would the speed diminish uniformly, and why?

A powerful forty feet high升80,000,000 cu. ft. of water every 24 hours. What horsepower does this represent? If the energy were delivered to a railway by an electric plant the efficiency of which is 75 per cent, how many cars requiring 350 kilowatts each could be operated?

A gun weighing 8.6 lbs. discharges a bullet weighing 0.0322 lbs. with a velocity of 2000 feet per second. How much kinetic energy is imparted to the gun? How much energy had the bullet, and what portion remains kinetic energy if the bullet strikes a free body weighing 128.8 lbs.? What becomes of the rest?

A kilogram mass attached to a string 1 meter long revolves in a horizontal plane with the string as the axis. The tension in the string when horizontal is 3 times the weight of the mass. Find the tension when the mass is at the top of its orbit.

Write the equations for uniformly accelerated motion and explain from a mathematical point of view what you mean. What is the speed of the bullet when it leaves the gun, and what portion of its original energy has it when it is 1000 feet from the gun?

Two 20-ton syphon boats are required to pump a tank of water 500 feet high. The difference in level is 25 feet and the velocity of the water is 5.0 feet per second. What is the horsepower necessary to pump the tank 1000 feet high, neglecting air friction?

If the energy were delivered as heat, how many kilograms of steam would be required to produce the same amount of work?

The mass of the moon is 1.80 of the mass of the earth. How much would a United States standard pound weigh on this moon? If the moon is attracted toward the earth, why is there no collision?

The atmospheric pressure is one ton per square foot, calculate the height of an oil manometer of 1 in. of oil.

Why are barometric heights reduced to 0 degrees C.?

A small wheel, weighing 100 lbs., moves on a horizontal surface with a velocity of 1500 feet per minute. How many foot-pounds of energy are required to bring it to rest? What is the work done if the wheel is brought to rest with a constant force of 1000 lbs.?