PHYSICS WORKSHEET: WORK & ENERGY

A 1.20 x 10³ kg block starting from rest is accelerated by a 2.20 x 10³ N force for a distance of 50.0 meters along a horizontal frictionless surface. (a) What is the final velocity of the mass? (b) How much work was done on the mass?

2. A stock boy is told to put boxes of mass 5.0 kg on shelves that are 1.5 meters above the floor. The young man finds that he can do this at a rate of 4.0 per minute. (a) How much work will be do in 15 minutes? (b) What is his power for this job?

3. A horse pulls a carriage filled with people around a circular park road of radius 0.50 km. The horse exerts an average force of 8.0 x 10². How much work does the horse do in a round trip? (b) If it takes 12 minutes to circle the park, what is the horse's power output?

4. A girl starts from home a pulls her wagon around the block (a distance of 700.0 meters). The wagon weighs 90.0 N and the handle makes an angle of 40.0° with the road. If he pulls with an average force of 75.0 N, how much work does he do?

A spring has a spring constant of 248 N/m. Find the force required to (a) stretch the spring by 3.00 cm, and (b) compress the spring by the same amount.

6. A 170 N force is necessary to compress a spring a distance of 40.0 cm. (a) What is the spring constant?
(b) What is the elastic potential energy stored in the spring? (c) What energy would be stored in the spring if it were compressed 80.0 cm?

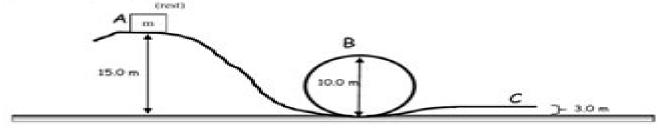
 A spring has spring constant k = 380 N/m. How much must this spring be compressed to store 60.0 Joules of energy?

8. A physics book weighing 20.0 N is dropped from a position 2.00 meters above the floor. (a) What is the potential energy of the book before it is dropped? (b) What is the kinetic energy of the book when it is 1.00 meter from the floor? (c) What is the speed of the book the instant before it reaches the floor?

9. A ball of mass 0.50 kg is rolling across a table top with a speed of 5.0 m/s. When the ball reaches the edge of the table, it rolls down an incline onto the floor 1.0 meter below (w/o bouncing). What is the speed of the ball when it reaches the floor?

10. A hot-wheels car of mass 0.025 kg is traveling on a horizontal track with a velocity of 5.0 m/s. If the track suddenly turns upward, how high up the track will the car travel?

 Figure 1 shows a 1.00 kg object ready to start sliding downward on a frictionless track. Compute the velocity of the object at points B, and C.



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M.R. Kibby

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