~~$KE = \frac{1}{2}mv^2$~~ ~~$W = F\Delta x$~~ ~~$\Delta KE = W$~~ ~~$GPE = mgh$~~ ~~$\Delta PE = W$~~

Work & Gravitational Potential Energy

Solve the following using methods demonstrated in class. **BE SURE TO SHOW ALL WORK IN ORDER TO RECEIVE FULL CREDIT – Use method for *METHOD FOR SOLVING WORD PROBLEMS.***

NOTE: Ignore all dissipated energy

$K = \frac{1}{2}mv^2$

$P = mgh$

$K + P = E$ ↑ total energy

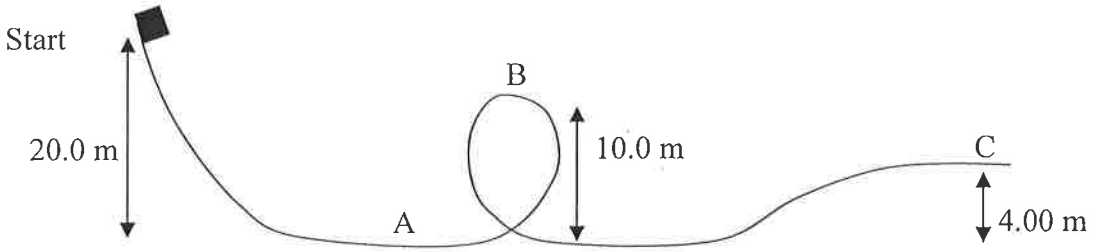
Formulas

1. A book has a weight of 20.0 N and is dropped 2.00 meters above the ground.
   a. What is the gravitational potential energy of the book just before it is dropped?
   b. What is the kinetic energy of the book when it is 1.00 meter above the ground?
   c. What is the speed of the book when it reaches the floor?

2. A ball of mass 0.50 kg is rolling across the table with a speed of 5.00 m/s. When the ball reaches the edge of the table, it rolls down an incline onto the floor 1.0 meter below. What is the speed of the ball when it reaches the floor?

3. A car of mass 0.026 kg is moving on a horizontal track with a velocity of 5.79 m/s. If the track suddenly turns upward, how high up the track will the car travel?

4. In the picture below, a 1.00 kg object is ready to start falling downward on a frictionless track. Compute the velocity at points A, B and C.



5. The picture below shows a 20.0 kg cart that is to be rolled up a 5.00 meter long incline, 2.00 meters high. Ignore friction.

↑ not homework

   a. How much average force must be exerted to move it to the top of the ramp?
   b. If the cart began rolling back down the ramp, what would its velocity be when it reached the bottom?