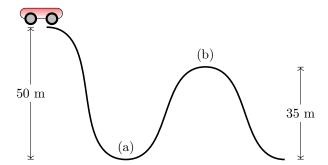
Conservation of Energy Problems

Consolidation

A roller coaster (m = 1000 kg) starts from rest at the top of a 50 m hill. The tracks are frictionless.

- (a) If the hill goes all the way down to the ground, how fast should it be going at that point?
- (b) Next, the roller coaster continues to the top of the next hill, which is 35 m high. What is its velocity at the top of the next hill?



Practice Problems

- 1. A spring of constant k=200 N/m is used in the launcher of a pinball machine. The player pulls back on the knob, so the spring is compressed by 0.15 m from its equilibrium position by a pinball of mass 0.13 kg. When the spring is released, the ball is shot forward (it is not attached to the spring). After release the ball moves up a slanted frictionless ramp until it is 0.20 m above the starting point.
 - (a) How fast is the ball moving at the top of the pinball machine?
 - (b) If, instead, it is only moving at 4.9 m/s, how much work was done by friction?



2. A 2-kg block is kicked up a ramp with an initial speed of 5 m/s. How much work does friction do if it makes it to a height of 1.1 m before falling back down the ramp?