

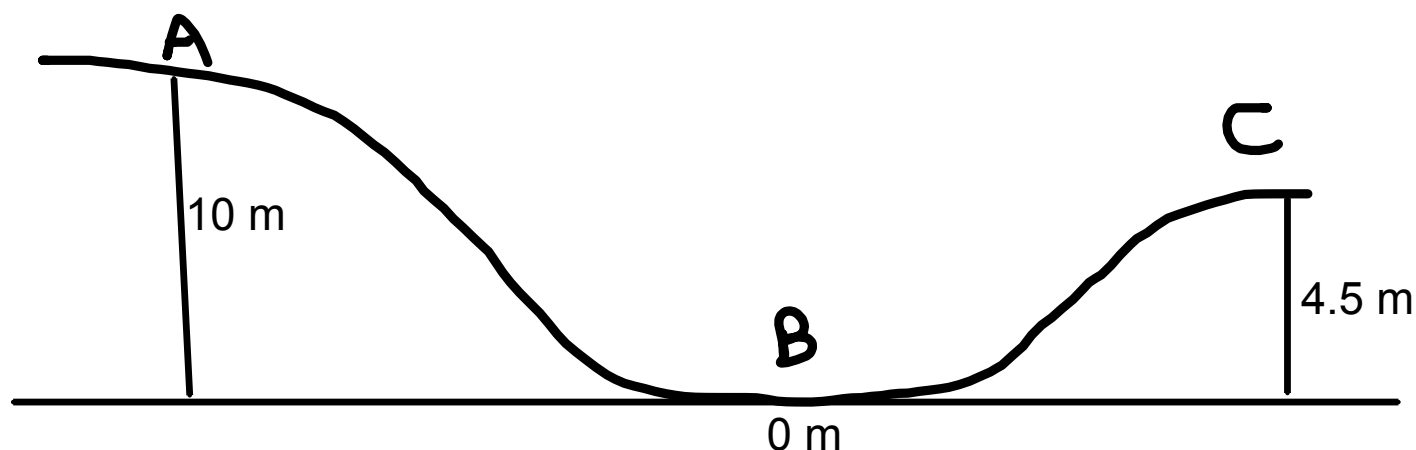
Projectile and Conservation of Energy Assignment

Due: April 29, 2020

Total: /20

Name:

1. Riley and Jeffery invent a game involving a potato cannon and a large moveable target. They can fire the cannon at 16 and the potato is released at 10 m/s. If they tie Mitchell to the target, at what distance should they place the target to ensure that they hit him? How long does Mitchell have to untie the ropes before impact? Ethan and Katelyn look on with interest. [5 marks]
2. Lucas, Eric and Quinn go tobogganing on one of those icy hills; which is so slippery it can be considered to be frictionless. It is real snow, not the fake stuff. They start from an initial speed of 2.3 m/s at the top of the hill as shown in the diagram. The toboggan has a mass of 3.0 kg and the three students have a combined mass of 250 kg. It is a sunny day and the snow has a temperature of -4°C ! Find the speed of the tobogganers at point B and C. [5 marks]



3. Isabelle has always wanted to try cliff diving. So she runs off a cliff with a speed of 4 m/s and dives into the water 10.5 m below. Isabelle has a mass of 55 kg.
 - a. What total energy will Claire have at the top of the cliff?
 - b. What will her speed be as she enters the water below?
 - c. What speed will she have at a distance of 6 m above the water? [5 marks]
4. Craig drops a basketball (0.9 kg) from a height of 15 m above the ground. If the ball loses 35 % of its total energy as it bounces back up, to what maximum height will it rebound? (conservation of energy) [5 marks]