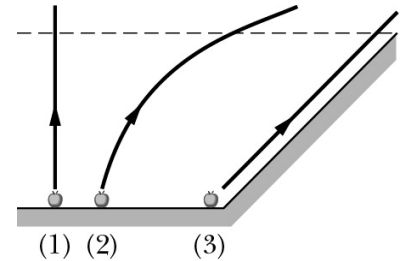


Quiz #8: Interactions and Potential Energy

Problem 1 (2 points)

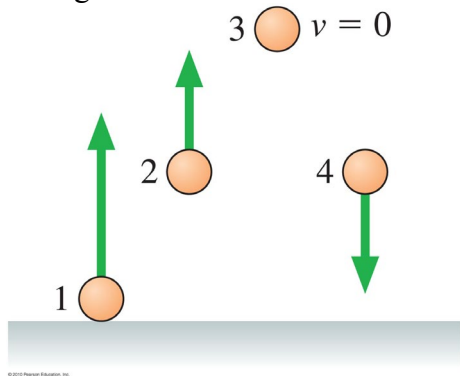
The figure shows three rocks that are launched from the same level with the same speed. One is launched straight upward, one is launched at an angle, and one is launched along a frictionless incline. Ignoring air resistance, rank the rocks according to their speed when they reach the dashed line, greatest first.



- a) 1
- b) 2
- c) 3
- d) all tie

Problem 2 (2 points)

Rank in order, from largest to smallest, the gravitational potential energies of the identical balls 1 through 4.

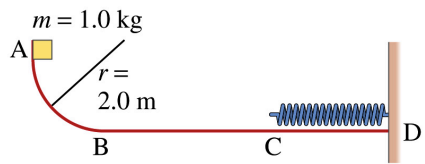


Problem 3 (2 points)

A block initially at rest is allowed to slide down a frictionless inclined ramp and attains a speed v at the bottom. To achieve a speed $2.50v$ at the bottom, how many times as high must a new ramp be? *Explain your answer.*

Problem 4 (4 points)

Consider the track shown in the figure below. The section AB is one quadrant of a circle of radius 2.0 m and the spring constant of the spring is 435 N/m.



a) If the entire track is frictionless, how far will the spring be compressed if the block is released from rest at point A.

b) Now suppose that section BC of the track, which has a length of 2.5 m, is not frictionless. (Note: sections AB and CD are still frictionless). If the coefficient of kinetic friction between the block and section BC of the track is $\mu_k = 0.35$, how far will the spring be compressed if the block is released from rest at point A?