

Quiz #8: Interactions and Potential Energy

Problem 1 (1.5 points)

A cart on an air track is moving at 1.0 m/s when the air is suddenly turned off. After the air is turned off, friction does work on the cart and it comes to rest after traveling 0.5 m. The experiment is repeated, but now the cart is moving at 2.0 m/s when the air is turned off. How far does the cart travel before coming to rest?

- a) 0.5 m
- b) 1.0 m
- c) 2.0 m
- d) 4.0 m
- e) not enough information

Problem 2 (1.5 points)

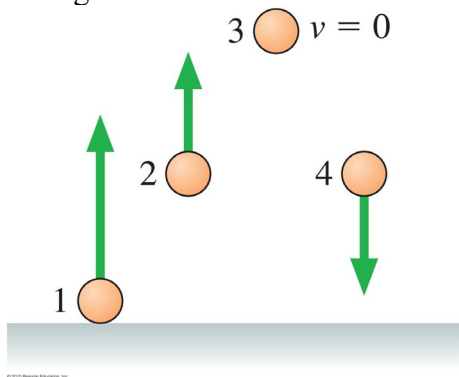
Swimmers at a water park have a choice of two frictionless water slides as shown in the figure below. Although both slides drop over the same height, h , slide 1 is straight while slide 2 is curved, dropping quickly at first and then leveling out. How does the speed v_1 of a swimmer reaching the end of slide 1 compares with v_2 , the speed of a swimmer reaching the end of slide 2?



- a) $v_1 > v_2$
- b) $v_1 < v_2$
- c) $v_1 = v_2$
- d) No simple relationship exists between v_1 and v_2 because we do not know the curvature of slide 2.

Problem 3 (2 points)

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



Problem 4 (5 points)

In the figure below, a small block is sent through point A with speed 7.0 m/s. Its path is frictionless except for the section of length $L = 6.50$ m, where the coefficient of kinetic friction is 0.55. The indicated heights are $h_1 = 6.0$ m and $h_2 = 2.0$ m. **(a)** What is the speed of the block at point C?
(b) What is the speed of the block at point D?

