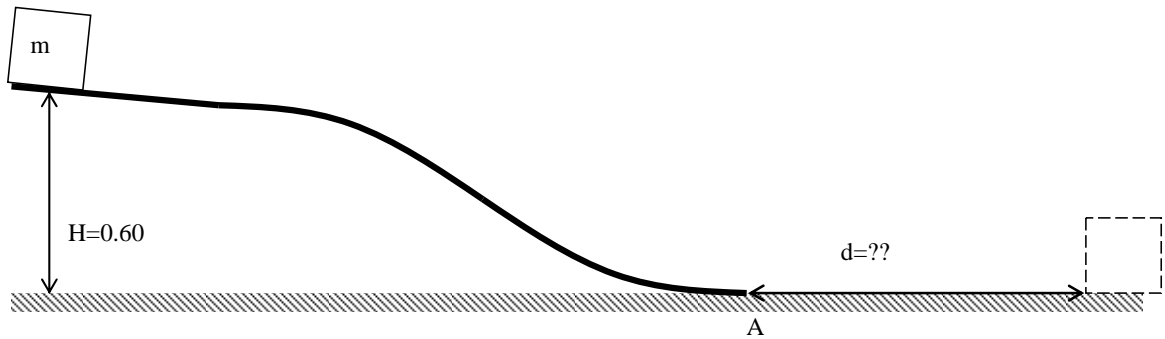


1. A tennis ball has a velocity of 12 m/s downward just before it strikes the ground and bounces up with a velocity of 12 m/s upward. Which one of the following statements concerning this situation is true?
 - (a) The momentum of the ball is conserved.
 - (b) Neither the momentum or the kinetic energy of the ball is conserved.
 - (c) The kinetic energy of the ball is the same before or after the collision.
 - (d) The total of energy of the ball is changed after the collision.
 - (e) None of above.

key: c

2. A small object, whose mass is 0.050 kg, is sliding down a **frictionless** track. The height of the track is .60 m. At the end of the track, shown as point A in the graph, the object keeps sliding on the ground whose coefficient of friction is $\mu_k = 0.20$. How far does the object slide on the ground beyond point A?



Solution:

When the object is on the track, only gravity does the work, the normal force doesn't do the work. We can apply the work-energy theorem.

$$W_{total} = \Delta KE \text{ where}$$

$$W_{total} = W_{mg} + W_N + W_{friction} = mg(h_i - h_f) + 0 + F_{friction} \cdot d \cdot \cos(\theta)$$

(What is θ here???)

$$\text{and } f = N \cdot \mu_k = (0.050\text{kg})(9.8\text{m/s}^2)(0.20) = 0.098 \text{ N}$$

$$\text{Plug in } \Delta KE = KE_f - KE_i = 0 - 0$$

we have $d = 3.0 \text{ m}$