SP211
Quiz 5: 9 Oct. 2015

For each of the following questions please write the most correct answer in using CAPITAL LETTERS in the space provided.

**Question 1**

A 3 kg block slides down a frictional plane that is inclined at 20° above the horizontal and whose height is 1 meter. The block starts from rest at the top of the plane, and its speed is measured to be 2 m/s when it reaches the bottom of the incline. What was the work done by friction during the slide? Assume that g = 10 m/s² for ease of calculation.

A) 30 J  
B) -30 J  
C) 24 J  
D) -24 J  
E) -6 J

Answer: D

**Question 2**

A 50 kg adult is teaching a 10 kg child how to ice skate. The two start out at rest standing together on a frictionless (or at least nearly so) ice rink. The adult gently pushes the child forward. Some time later you measure that the child has traveled 5 meters forward after the push. At that time how far has the adult slid?

A) 0 m  
B) 1 m  
C) 2 m  
D) 4 m  
E) 5 m

Answer: B

\[
\vec{F}_{\text{net,ext}} = 0 = Ma_{\text{com}}
\]

\[
\Rightarrow a_{\text{com}} = 0
\]

\[
\text{no Center of mass accel!}
\]

\[
X_{\text{com}} = 0 = \frac{m_1X_1 + m_2X_2}{M}
\]

\[
0 = \frac{10 \cdot 5 + 50 \cdot X_2}{60}
\]

\[
\Rightarrow X_2 = -1 \text{ m}
\]

so adult is 1 m away from start.