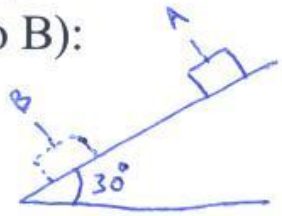
Phys. 101 - Sec # 1 **Quiz # 5 (Ch. 7)**

Name: Key ID #

A 5.0 kg object starts from rest at point A, and slides 4.0 m down an inclined plane to point B (see the figure). The coefficient of friction is 0.2.



1- Find the **work done** (from point A to B):

a) By the gravitational force.

$W_g = \vec{F}_g \cdot \vec{d} = mg\,d\cos 60$

$= (5)(9.8)(4)\cos 60$

$= \boxed{98\ J}$

b) By the frictional force.

$W_f = -f_k d = -\mu_k N d = -\mu_k mg\cos 30\, d$

$= -(0.2)(5)(9.8)\cos 30\,(4) = \boxed{-34\ J}$

c) By the normal force.

$\boxed{W_N = 0}$

because it is $\perp$ to the direction of motion.

2- Calculate the speed of the object at point B.

$W_{net} = \Delta K$

$98 - 34 = \frac{1}{2} m (v_f^2 - v_i^2)$ ($v_i = 0$)

$64 = \frac{1}{2}(5) v_f^2$

$v_f = \sqrt{\frac{2 \times 64}{5}} = \boxed{5\ \frac{m}{s}}$