

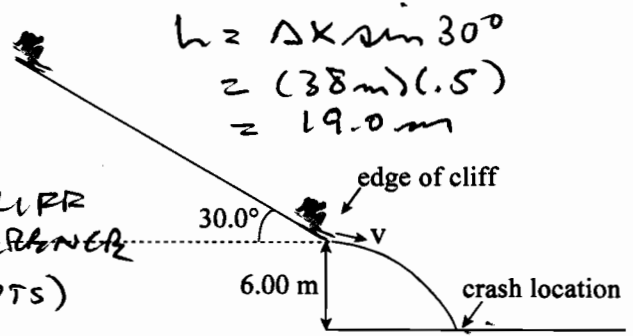
## EXAM 2

Name: \_\_\_\_\_

Student ID #: \_\_\_\_\_

TA (circle one): Aaron      Eric      Farid      Heather      Mark

A young extreme skier (mass = 52.0 kg), starting from rest, skies down a 30.0° slope and after traveling 38.0 m, arrives at the edge of a cliff. From the place the skier starts to edge of the cliff, the force of kinetic friction does an amount of work whose magnitude is 3600 J.



A. [16 pts.] What is the speed of the skier at the edge of the cliff?

(4 PTS) USE PE @ EDGE OF CLIFF FOR PE<sub>0</sub> RATHER THAN

$$W_{nc} = E - E_0$$

$$-3600 \text{ J} = \frac{1}{2} m v^2 - m g h \quad (10 \text{ PTS})$$

$$\frac{1}{2} m v^2 = -3600 \text{ J} + (52 \text{ kg})(9.8 \text{ m/s}^2)(19 \text{ m})$$

$$= 6082 \text{ J}$$

$$v = \sqrt{\frac{(2)(6082 \text{ J})}{52 \text{ kg}}}$$

$v = 15.3 \text{ m/s}$

(2 PTS)

B. [16 pts.] What is the speed of the skier at the moment before she crashes?

USE ENERGY CONSERVATION AGAIN. SET CRASH LOCATION AS REF. FOR PE.

(4 PTS)  $W_{nc} = E - E_0$  IN THIS CASE  $W_{nc} = 0$

$$E = E_0$$

(8 PTS)  $\frac{1}{2} m v_f^2 = \frac{1}{2} m v^2 + m g h_{NEW}$

$$v_f^2 = v^2 + 2 g h_{NEW}$$

$$v_f = \sqrt{(15.3 \text{ m/s})^2 + (2)(9.8 \text{ m/s}^2)(6 \text{ m})}$$

(2 PTS) 

$v_f = 18.7 \text{ m/s}$