3.2 Cliff Problem Quizlette (turn this in)   **Name_____**

1. Red Elk runs at a speed of 9.20 m/s horizontally off a cliff that is 6.40 m above the water.

A) Set up your horizontal/vertical table, fill it with known quantities, and solve for everything you don't know. (You know horizontally: both velocities and the acceleration, and vertically: the displacement, the initial velocity, and the acceleration)

H	V
X	X
V_i	V_i
V_f	V_f
a	a
t	t

B) What time is he in the air? (1.14 s)	C) What is his final vertical velocity of impact? (Just before he hits the water) (-11.2 m/s)	D) How far from the base of the cliff does he hit the water? (10.5 m)
E) Draw a picture of his final velocity of impact. Calculate the speed he is traveling, and find the angle below horizontal his velocity makes. (14.5 m/s, 50.6° below horiz.)		F) What is his speed of impact with the water? (14.5 m/s)

2. Red Elk runs with a purely horizontal velocity and lands 8.50 m from the base of the cliff 1.20 seconds later.

a. How high is the cliff?	b. What was his horizontal velocity?	c. What is his final vertical velocity?

d. Draw a picture of his final velocity of impact. Calculate the speed he is traveling, and find the angle below horizontal his velocity makes.

a) 7.06 m, b) 7.08 m/s, c) -11.76 m/s, d) 13.7 m/s at 58.9° below horiz.

3. Red Elk runs with a purely horizontal velocity of 5.60 m/s and hits the water 1.80 seconds later.

a. How high is the cliff?	b. How far from the base of the cliff does he land?	c. What is his final vertical velocity?

d. Draw a picture of his final velocity of impact. Calculate the speed he is traveling, and find the angle below horizontal his velocity makes.

a) 15.9 m, b) 10.1 m, c) -17.64 m/s, d) 18.5 m/s at 72.4° below horiz.

4. Red Elk runs with a purely horizontal velocity of 4.30 m/s and lands 5.10 m from the base of the cliff .

a. What time was he in the air?	b. How high is the cliff?	c. What is his final vertical velocity?

d. Draw a picture of his final velocity of impact. Calculate the speed he is traveling, and find the angle below horizontal his velocity makes.

a) 1.186 s, b) 6.89 m, c) -11.6 m/s, d) 12.4 m/s at 69.7° below horiz.

5. Red Elk runs with a purely horizontal velocity and lands 8.60 m from the base of a 13.0 m tall cliff.

a. What time is he in the air?	b. What is his horizontal velocity?	c. What is his final vertical velocity?

d. Draw a picture of his final velocity of impact. Calculate the speed he is traveling, and find the angle below horizontal his velocity makes.

a) 1.629 s, b) 5.280 m/s, c) -15.962 m/s, d) 16.8 m/s at 71.7° below horiz.