3.3 Arc Problem Quizlette (turn this in)   **Name**_____

Red Elk shoots an air rocket at a speed of 25.0 m/s at an angle of 57.0° above the horizontal on a very level field.

A) Break the velocity vector into components. (These become your initial velocities for x and y) 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, both velocities, and the acceleration) (13.616 m/s x + 20.967 m/s y)

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

B) What are the initial horizontal and vertical velocity components? (13.616 m/s x + 20.967 m/s y)	C) What time is the rocket in the air? (4.27 s)	D) How far does the rocket go before hitting the ground? (58.2 m)
E) What is the greatest height the rocket reaches? (22.4 m)		F) What is the speed of the rocket at the highest point? (13.6 m/s)

Red Elk kicks a ball at a speed of 28.0 m/s at an angle of 34.0º above the horizontal on a very level field.

1. What time is the ball in the air? (3.20 s)

2. What horizontal distance does it travel
before hitting the ground again? (74.2 m)

3. What is the greatest height the ball
reaches? What is its speed at this height?
(12.5 m, 23.2 m/s)

Use the range equation to find these ranges for the velocities and launch angles. Write down what you put into your calculator:

Velocity = 32.0 m/s, Launch Angle = 47.0º Range = _____
(104 m)

Velocity = 11.0 m/s, Launch Angle = 26.0º Range = _____
(9.73 m)

Use the range equation to find the proper launch angles for the following velocities and ranges. Write down what you put into your calculator:

Velocity = 29.0 m/s, Range = 32.0 m, Launch Angles = _____ and _____ degrees
(10.9º and 79.1º)

Velocity = 12.0 m/s, Range = 14.5 m, Launch Angles = _____ and _____ degrees
(40.3º and 49.7º)