

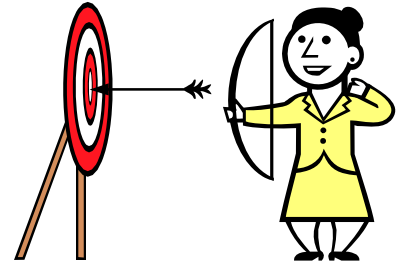


**Steps to Solving these types of problems.**

- **Step 1: Sketch the system**
- **Step 2; Establish the components of the initial velocity**
- **Step 3: Solve for time (also called hangtime)**
- **Step 4: Find the range (max horizontal distance)**
- **Step 5; Find the apex of the projectile (max height)**

**1. An Archer shoots an arrow at an angle of 36 degrees to the horizontal with an initial velocity of 136 m/s. Find:**

Sketch the system



a) The initial x and y components of velocity

b) If a target is 100 m away, did the arrow reach the target? Solve for the distance the arrow traveled.

c) What was the maximum height the arrow reached?

d) How long was the arrow in the air?

e) What was the final speed of the arrow just before it reached the ground?

**HW Problem:**

**1. A baseball player hits a ball at an angle of 27 degrees to the horizontal with an initial velocity of 145 m/s. Find:**

Sketch the system



a) What was the initial  $V_x$  of the ball? The initial  $V_y$  of the ball?

b) How far into the outfield did the ball reach?

C) What was the maximum height the baseball reached?

D) What was the total hangtime of the ball?

E) What was the final speed of the ball just before it was caught?

