

## Lab 4 - Projectile Motion (numerical)

Name \_\_\_\_\_

Partner's Name \_\_\_\_\_

In excel, develop a spreadsheet file which will calculate the x and y position of a particle given the following:

Initial position ( $x_0$  and  $y_0$ )

Initial velocity ( $v_0$ )

Initial angle of projection ( $\theta_0$ )

Local value of gravity ( $a$ )

Your spreadsheet should list a range of times starting at zero with  $\Delta t \leq 0.05$  sec. There should be a set of corresponding x and y values. And finally the x-y projection should be graphed.

Verify the performance of your spreadsheet with me before continuing.

Assuming the following:  $x_0 = y_0 = 0.0$  m,  $v_0 = 10$  m/s, and  $a = 10$  m/s<sup>2</sup>; answer the following question.

What are the distance traveled when the particle returns to the ground after being launched from  $\theta_0 = 10^\circ, 20^\circ, \dots, 80^\circ$ ? Tabulate your answers below.

Verify experimentally from data in Lab 3 and record results on the back of this page!