**Physics 200 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

*Projectile With Drag Spreadsheet*

A most efficient home run

**Due on Friday (11/16)** -- Complete individually.

Part 1: Finding Angle and Speed

* + The Problem -- What is the minimum speed at which a baseball must leave a bat in order to reach the fence (in the air) 340 feet away?  What is the angle for this hit?  Assume that the density of the air is 1.22kg/m3, the mass of the baseball is 0.145kg, the circumference of the ball is 0.23m, and the ball's drag coefficient is 0.45. Also assume that the baseball’s flight is symmetric (i.e. the starting and ending heights are equal). Enter your answers below.
  + Hint: Modify your spreadsheet to make this easier.
    - Create a cell for X position at the moment of final impact
    - Replace the purple cells with data, and use formulas to calculate initial X and Y velocities.

Part 2: Visualizing Trajectory:

Create a graph of Y position vs X position to show this baseball's flight path.  Adjust the X and Y axes so that the scales are approximately equal and, therefore, the shape of the flight path is undistorted. To turn the graph in, either use the snipping tool to email your graph to Mr. Stapleton or show your graph below. If you show the graph below, include the units and make a reasonable effort to preserve the scale and proportions.

**Answers:**

340 Ft Home Run Minimum V0 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Required angle for 340 Ft Home Run with Minimum V0 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Draw your trajectory graph in the space below. You may also print it and paste it or email a picture to Mr. Stapleton.