Task name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Your name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Start by writing the cannon settings in the table. Then complete the following table by filling in values from your launches. “Distance” refers to the horizontal distance of the projectile from the launch point. “Height” refers to the projectile’s vertical distance above the initial launch height of 1.2 meters.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Angle |  | Initial Speed |  | Mass  |  | Diameter |  |

 *\*remember “Air Resistance” should always remain unchecked*

|  |  |  |
| --- | --- | --- |
|   | Distance | Height |
| Start |  |  |
| Intermediate |  |  |
| End |  |  |

You may use a matrix to solve the system.

Given the equation of a quadratic in standard form is:

$$y=ax^{2}+bx+c$$

Substitute the co-ordinates from the start, intermediate, and end points to write a system of equations with unknowns *a, b*, and *c.*

Start equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Intermediate eq:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

End equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

$$rref\left[\begin{matrix}\\_&\\_ \\_&\\_\\\\_& \\_ \\_&\\_\\\\_& \\_ \\_&\\_\end{matrix}\right]=\left[\begin{matrix}\\_&\\_ \\_&\\_\\\\_& \\_ \\_&\\_\\\\_& \\_ \\_&\\_\end{matrix}\right]$$

a=\_\_\_\_\_\_\_\_\_\_\_\_ b=\_\_\_\_\_\_\_\_\_\_\_\_\_\_ c=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Projectile function:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_