College Algebra
Projectile Motion Project **Name** _____

The height in feet, H(t), of a projectile starting from ground level can be approximated over time t (in seconds) using the following function:

$$H(t) = v_0 t - 16t^2$$

1. Complete the table for an initial velocity of 80 fps $\left[v_0 = 80 \ {}^{ft}/_{sec} \right]$. Show your set up on one problem.

Time (seconds)	0	0.5	1	1.5	2	2.5	3	3.5	4
Height (feet)									

2. Sketch the points on the graph provided below, and sketch a curve that contains the points in your scatter plot. Put the dependent variable on the vertical axis. Clearly label the axes, and use a consistent scale on each axis.

3. According to the equation, when does the projectile reach its maximum height? Show the use of the $-\frac{b}{2a}$ method.

4. Find the maximum height the projectile reaches.

5. What is the duration of the projectile's flight? Explain your reasoning.

6. List the following features of the parabola given by $y = -16x^2 + 80x$:

Vertex: _____

y-intercept: _____

x-intercepts: _____ and _____

Axis of symmetry: _____

7. Rewrite the equation in #6 in vertex form: $y = a(x - h)^2 + k$.

_____

Do your best! Live and learn!