Rockets Name: _____

We will go outside and launch the rockets. Each person does their own worksheet.

We are using the vertical motion model formula to find the rocket's initial velocity and then the maximum height of the rocket. For those of you who don't remember this formula from math class, or who never learned it, here is a brief explanation:

Vertical motion formula: $h(t) = -16t^2 + vt + 2$

t is the time in seconds
h(t) is the height at time t
v is the initial velocity in feet per second
-16 is the force of gravity on Earth pulling down on the rocket
2 is the starting height (the rocket is 2 feet off the ground when it starts)

1. Write your rocket's time here: _____

2. Plug your time (what you just wrote above) into the equation below and solve for v. You will need a calculator. This will tell us the initial velocity (how fast the rocket was moving when it left the launcher.) Round your answer to the nearest tenth. Show your work, as in at least one intermediate step. If you need help, ask for help. You should end up with a positive number for this calculation.

$$0 = -16 * (\quad)^2 + (\quad) * v + 2$$

Put your answer here (a positive number): v = _____

3. The rocket hits its highest point at this time: $\frac{v}{32}$ Find this time, rounded to the nearest tenth.

Put your answer here: t = _____

4. Plug your answers for v (#2 above) and t (#3 above) into the equation below. Simplify. This is approximately how high in the air your rocket reached at its peak.

$$h = -16 * (\quad)^2 + (\quad) * (\quad) + 2$$

t v t

Maximum height = _____

Does your answer seem reasonable? If not, can you figure out what went wrong? Check in with Mr. Hays; he has all of the answers. Turn this paper in when you are done.