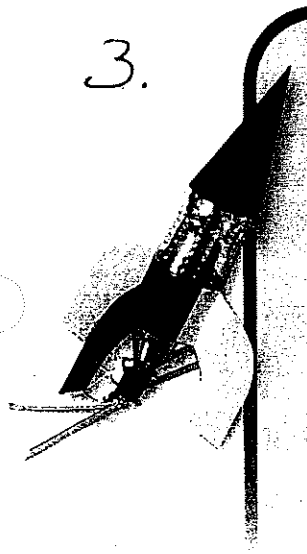
Algebra P4 (Assignment 11)

5 Word Problems!

1. Trent is a kicker for his football team. The height in feet of a football after one of Trent's kicks can be modeled by the function $f(x) = -16x^2 + 55x$, where x is the time in seconds after the kick. Find the football's maximum height and the time it takes the ball to reach this height. Then find how long the ball is in the air.

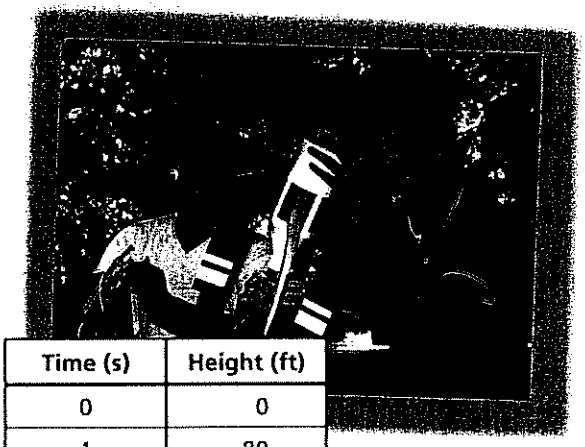
2. A juggler tosses a ring into the air. The height of the ring in feet above the juggler's hands can be modeled by the function $f(x) = -16x^2 + 16x$, where x is the time in seconds after the ring is tossed. Find the ring's maximum height above the juggler's hands and the time it takes the ring to reach this height. Then find how long the ring is in the air.

3.



Quadratic Functions

The Sky's the Limit The Physics Club is using computer simulation software to design a water bottle rocket that doesn't have a parachute. The data for their current design are shown in the table.



Time (s)	Height (ft)
0	0
1	80
2	128
3	144
4	128
5	80

1. Graph the data and connect the points.
2. Find and label the zeros, axis of symmetry, and vertex.
3. Explain what the x- and y-coordinates of the vertex represent in the context of the problem.
4. Estimate how many seconds it will take the rocket to reach 110 feet. Explain.

4. Shelly kicks her ball into the air. The height in feet above the ground of the ball can be modeled by $y = -5x^2 + 10x$. Will Shelly's ball go over a fence that is 6 feet tall? Explain. *(Lesson 9-2)*

5. The height in feet of the curved roof of an aircraft hangar can be modeled by $y = -0.02x^2 + 1.6x$, where x is the distance in feet from one wall at ground level. How tall is the hangar?