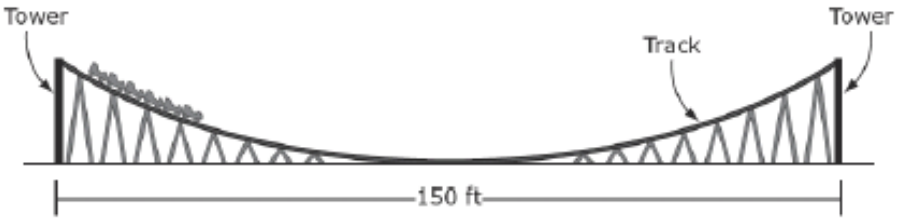
Quadratics 6 – Quadratic Application **Name _____**
Homework #1 **Per _____ Date _____**

1. The function $h(t) = -16t^2 + 144t$ describes the height of a model rocket t seconds after it has been launched at an initial velocity of 144 feet per second. How many seconds after it is launched will the rocket reach its maximum height? What is the maximum height?

2. The height of a ball, in feet, can be modeled by the function $h(t) = -16t^2 + 24t + 8$, where h(t) is the height of the ball, in feet, above the ground and t is the time in seconds. The ball is caught at a height of 6 feet on its way down. How long was the ball in the air? Show or explain your work.

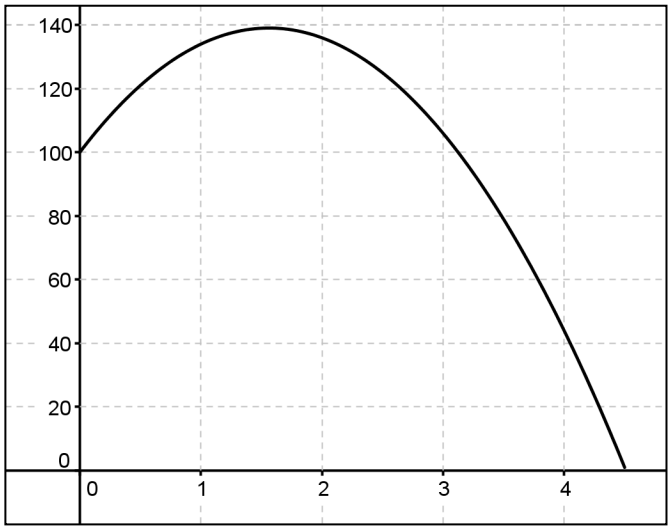
3. Consider the diagram below.



The function $h(x) = \frac{1}{98}x^2$ describes $h(x)$, the height of part of a rollercoaster track, where x is the horizontal distance in feet from the center of this section of track. The towers that support this part of the track are the same height and are 150 feet apart. What is the best estimate of the height of the towers?

4. Tommy the turtle stands on the edge of a cliff and tosses a pebble into the ocean below. The graph of the height of the pebble versus time, *h(t)*, is given below. (**Note:** The graph will give you a good idea of the approximate answers below, but most of the time you have to calculate the exact answer.)

The symbolic form for the function *h* is given by $h(t) = -16t^2 + 50t + 100$.



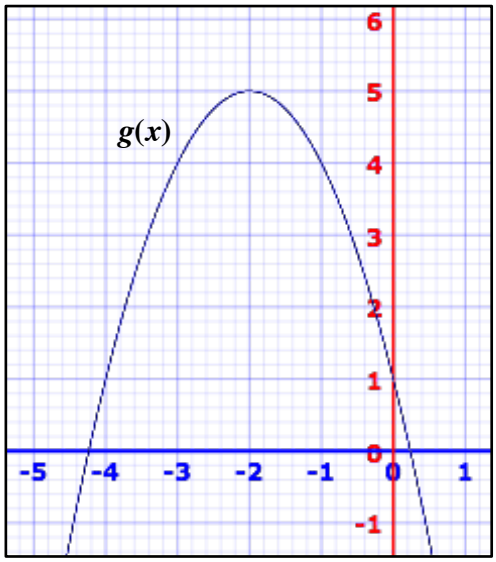
a. How high was the cliff?

b. How high did the pebble travel before it began to fall back? (Round to three decimal places)

c. When did it reach its highest point? (Round to three decimal places)

d. When did it hit the ground? (Round to three decimal places)

5. The equation $f(x) = -(x-5)^2 + 6$ represents ***f*(*x*)** and the graph represents ***g*(*x*)**.



Select whether each statement is **true** or **false** about the given functions.

Statement	True	False
a. The line of symmetry of *g*(*x*) is $x = 2$		
b. The maximum of *g*(*x*) is less than the maximum of *f*(*x*).		
c. The value of *x* when *f*(*x*) is at the maximum is less than the value of *x* when *g*(*x*) is at the maximum.		