Quadratic Applications

Name: _____ Date: _____

1. You drop a ball off a cliff at 320 ft. How long does it take the ball to hit the ground?
   $0 = -16t^2 + 320$

2. You launched a model rocket with an initial speed of 64 feet per second and a start height of 512. After how many seconds will the rocket hit the ground?
   $0 = -16t^2 + 64t + 512$

A ball is thrown into the air from a height of 256 feet at time t = 0. The function that models this situation is $h(t) = -16t^2 + 96t + 256$, where t is measured in seconds and h is the height in feet.

3. What is the height of the ball at 2 seconds? $h(2) =$

4. When is the ball at it's maximum height?

5. What is the maximum height?

6. When will the ball hit the ground? $0 = -16t^2 + 96t + 256$

7. If an object is thrown vertically upward, its height h, above the ground in feet after t seconds is given by $h = h_0 + v_0 t - 16t^2$, where h_0 is the initial height from which the object is thrown and v_0 is the initial velocity of the object. Using this formula solve the problem.

A ball thrown vertically into the air has the equation of motion $h = 48 + 32t - 16t^2$.

A) How high is the ball at t=0?

B) How high is the ball at t=1?

C) What is the vertex of the parabola that represents this object?

D) What direction is the object moving at 2 seconds?

E) What is the objects maximum height?

F) When is the object at it's maximum height?

G) When does the ball hit the ground again?

8. A bicyclist is riding at a speed of 18 mi/hr when she starts down a long hill. The distance *d* she travels in feet can be modeled by $d(t) = 4t^2 + 18t$, where *t* is the time in seconds. How long will it take her to reach the bottom of a **400** ft hill? $400 = 4t^2 + 18t$