Name	Period	Date	

Real Life Situations Modeled by Quadratic Equations – Algebra 8

You can solve most of the problems below with your knowledge of key features of parabolas! Each of the equations that model the situations can be factored. **Show all your work**, and don't forget units.

- 1. A relief package is released from a helicopter at 1600 feet. The height of the package can be modeled by the equation $h = -16t^2 + 1600$, where h is the height of the package in feet and t is the time in seconds.
 - a. What does the number 1600 in the equation represent?
 - b. How long it will take for the package to hit the ground?

- 2. The height of a flare fired from the deck of a ship in distress can be modeled by $h = -16t^2 + 104t + 56$, where h is the height of the flare above water and t is the time in seconds.
 - a. How high above the surface of the water is the deck of the ship?
 - b. How long will the flare be in the air?

- 3. Robert threw a rock off a bridge into the river. The distance from the rock to the river is modeled by the equation $h = -16t^2 16t + 60$, where h is the height in feet and t is the time in seconds.
 - a. How high above the river will the rock be 1 second after Robert throws it?

b. How long will it take for the rock to hit the surface of the water?

- 4. The height of a rocket launched upward from a 160-foot cliff is modeled by $h = -16t^2 + 48t + 160$, where h is the height in feet and t is the time in seconds.
 - a. How long will it take for the rocket to reach its maximum height?

b. How high will the rocket go?

- 5. The height of a rock thrown off a cliff can be modeled by the equation $h = -16t^2 8t + 120$, where h is the height in feet and t is the time in seconds.
 - a. How high above the ground is the rock 2 seconds after it is thrown?

b. How long does it take the rock to reach the ground?

- 6. During a game of golf, Kayley hits her ball out of a sand trap. The height of the golf ball is modeled by the equation $h = -16t^2 + 20t 4$, where h is the height in feet and t is the time in seconds since the ball was hit.
 - a. What does the -4 in the equation tell you about the situation?
 - b. Find how long it takes Kayley's golf ball to hit the ground.

c. How high was Kayley able to hit the golf ball? (This is tricky, think about the situation.)

d. How long after Kayley hit the ball will it reach its highest point?