A ball is shot into the air with an initial speed of 184 ft/sec from a height of 35 feet. The following equation models the height of the ball as a function of time:

$h(t) = -16t^2 + 184t + 35$

1. Find the maximum height of the ball.

LOS $t = \frac{-184}{-32} = 5.75$

$h(5.75) = 564$ ft

2. Find the time it takes to reach this maximum height.

5.75 sec

$h(t) = -16t^2 + 184t + 35$

How long does it take the ball to come back to the ground?

$0 = -16t^2 + 184t + 35$

$b^2 - 4ac = 36,096$

$t = \frac{-184 \pm \sqrt{36,096}}{-32}$

$-.19$, 11.69 sec

$h(t) = -16t^2 + 184t + 35$

How long will it take to reach a height of 100 feet?

$100 = -16t^2 + 184t + 35$

$-100 \quad\quad -100$

$0 = -16t^2 + 184t - 65$

$b^2 - 4ac = 29,696$

$t = \frac{-184 \pm \sqrt{29,696}}{-32} =$ 0.36, 11.14

An object is shot into the air from a height of 13 feet. The following equation models the height of the ball as a function of time: $h(t) = -16t^2 + 80t + 13$

How long will it take this object to reach a height of 70 feet?

$70 = -16t^2 + 80t + 13$

$0 = -16t^2 + 80t - 57$

$b^2 - 4ac = 2752$

$\frac{-80 \pm \sqrt{2752}}{-32}$

$t = .86, 4.14$