A golf ball is hit from the ground, and its height in feet above the ground is modeled by the function $h(t) = -16t^2 + 180t$, where t represents the time in seconds after the ball is hit.

How long is the ball in the air?
(2nd zero)

11.25 seconds

What is the maximum height of the ball? (max)

506.25 feet

How long did it take to reach the max height?

5.63 seconds

A softball is thrown upward with an initial velocity of 32 feet per second from 5 ft above ground. The ball's height in feet above the ground is modeled by $h(t) = -16t^2 + v_0t + h_0$, where t is the time in seconds after the ball is released.

initial velocity, initial height

$h(t) = -16t^2 + 32t + 5$

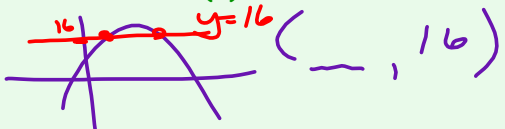
A. What is the maximum height of the ball? (max)

21 feet

B. At what time does the ball reach its maximum height? (x-value of vertex)

1 second

C. At what time(s) is the ball 16 feet high in the air?



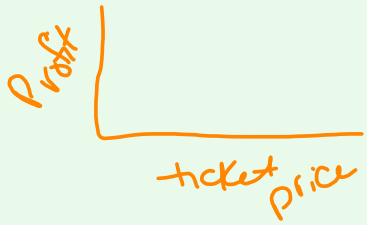
0.44 seconds to reach 16 feet the 1st time

1.56 sec to reach 16 feet the 2nd time

Each year a school's booster club holds a dance to raise funds. In the past, the profit the club made after paying for the band and other costs has been modeled by the function $P(t) = -16t^2 + 800t - 4000$, where t represents the ticket price in dollars.

A. What ticket price gives the maximum profit?

$25



B. What is the maximum profit?

$6,000

C. What ticket price would generate a profit of $5424?

$19 $31