Math-71 Sections 9, 11, 12

Homework #2

Due: 2/12/2019 5:45pm

Reading

- Read section 7.3.

Problem

A man stands on the edge of a 100 ft cliff. He throws a small red ball up in the air at a speed of 10 ft/s so that the ball rises to a peak height, stops, and then falls to the ground at the foot of the cliff. The equation of motion for this scenario is:

$$h(t) = 100 + 10t - 16t^2$$

where t is time (in seconds) and h is the height of the ball (in feet).

1. Use the definition of the derivative (i.e., the difference quotient from Section 7.3) to determine $h'(t)$, which gives the instantaneous velocity of the ball (in ft/sec) at a time t.
2. How fast is the ball moving at the instant it reaches its peak height?
3. How long does it take for the ball to reach its peak height?
4. What is the ball's peak height?
5. How fast is the ball going when it passes the cliff edge on the way down?