Math 111, Section 01, Fall 2014

Worksheet 7, Tuesday, October 28, 2014

Reminder: This worksheet is a chance for you not to just *do* the problems, but rather *understand* the problems. Please discuss ideas with your partners. Your solutions should be focused moreso on presentation than on numerical values.

Position–Velocity Problems

1. Suppose a falling ball's position is given by $s(t) = 256 - 16t^2$ feet at t seconds.

   (a) What is the ball's initial position above the ground?

   (b) Find the average velocity of the ball during the initial three seconds of its drop.

   (c) Find the velocity at 2 seconds and 3 seconds respectively.

   (d) How much time passed before the ball hit the ground?

   (e) What was the ball's velocity when it hit the ground?

   (f) Finally, find the ball's acceleration at 3 seconds.

2. A man stands on the edge of a bridge over a river. He throws a stone straight upward in the air with an initial velocity of 64 feet per second. The ball reaches a height of $s(t) = -16t^2 + 64t + 80$ feet in t seconds above the water. Answer the following questions:

   (a) What is the intitial height of the stone?

   (b) What is the maximum height the stone reaches?

   (c) What is the stone's velocity at time $t = 1$ second?

   (d) When is the stone 128 feet above the water?

   (e) What is the stone's acceleration at any time t?

   (f) At what time will the stone hit the water?

   (g) What is the stone's velocity when it hits the water?

$$\boxed{\textbf{Turn in your own solutions.}}$$