# PROBLEM OF THE MONTH #1

## NOVEMBER 2013

Open to all students whose mathematics classes come solely from the following list: Math 92, Math 155, Math 161, Math 162, Math 163, Math 165, Math 177, Math 287, Math 185, Math 241, or Math 277 or their equivalent.

**Directions:** Write a complete solution to the problem below showing all work. Your paper must have your name, W#, and Southeastern email address. Solutions are to be placed in the envelope for Problem #1 located in the Department of Mathematics Office, Fayard 308 by 4:30 p.m., **Wednesday, December 4**. No late papers will be accepted.

All papers with a correct solution will be entered in a drawing for a great prize!

Questions concerning the problem of the month should be sent to either Dr. Tilak de Alwis (tdealwis@selu.edu), or Dr. Randy Wills (rwills@selu.edu)

## Problem : *Going, going, and gone!*

A ball is thrown from the origin at time $t = 0$ with a certain speed, and at some unknown angle with the positive $x$-axis. Its position $P(x, y)$ at time $t$ (in seconds), where $x$ and $y$ are in feet, is given by the equations:

$$x(t) = 30t$$
$$y(t) = 30\sqrt{3}\, t - 16t^2$$

(a) Find the maximum height reached by the ball.

(b) For how long does the ball stay more than 30 feet above the ground-level?