

**Practice Problems 5 - Math 141, Frank Thorne (thornef@mailbox.sc.edu)**

**Any of these problems that might appear on a quiz, assessment, or the final exam.** You will be expected to show your work, write in complete sentences, and explain your reasoning clearly.

**Important.** When doing related rates problems you are **required to draw and label a suitable picture** when appropriate to the problem.

- (a) Thomas, 3.10, 11-42.
- (b) A searchlight  $L$  is 200 feet from a prison wall. It rotates at a constant rate of one revolution per 6 minutes.  
An escaped felon is running along the wall trying to keep just ahead of the beam of light. At the moment when the searchlight angle is 45 degrees, how fast does the prisoner have to run?
- (c) What do the words **absolute maximum**, **absolute minimum**, **local maximum**, and **local minimum** mean?
- (d) What is the first derivative theorem for local extreme values? Give a brief, informal explanation for why it is true.
- (e) (Trick question. Explain why.) Explain how to find all the absolute maxima of a function.
- (f) Explain how to find the absolute extrema of a continuous function on a closed interval.
- (g) Thomas, Ch. 4.1, 1-8, 21-40, 53-68.