

MA 114H CALCULUS II, FALL 2014
WRITTEN ASSIGNMENT #3
Due **Friday, 5 December 2014**, at the beginning of lecture.

Instructions: The purpose of this assignment is to develop your ability to formulate and communicate mathematical arguments. Your complete assignment should have your name and section number on each page, be stapled, and be neat and legible. *Unreadable work will receive no credit.*

You should provide well-written, complete answers to each of the questions. We will look for correct mathematical arguments, careful explanations, and correct use of English. Your solution should be formulated in complete sentences. As appropriate, you may want to include diagrams or equations written out on a separate line. Your textbook provides examples of how we communicate mathematics.

Students are encouraged to use word-processing software to produce high quality solutions. However, you may find that it is simpler to add graphs and equations using pen or pencil.

1. (10 points) Snow has been falling steadily for a while when a snowplow sets out at noon. The snow plow clears a constant volume of snow per unit time. It covers two miles in the first two hours, but only one mile in the second two hours. When did it start to snow that day?

HINT: Formulate this as a differential equation for a dependent variable $y(t)$ describing the miles cleared by the snowplow since noon. Take $t = 0$ as noon. It started snowing earlier, say at $t = -a$, for some $a > 0$. We want to find a . Note that the miles plowed per unit time is inversely proportional to the snow depth at the time.