MATH 141 HOMEWORK 6 DUE DATE: MONDAY, JUNE 5TH

Name:_____

This homework is due Monday, June 5th during recitation. If you have questions regarding any of this, feel free to ask during office hours or send me an email. When writing solutions, present your answers clearly and neatly, showing only necessary work.

You will notice that these are the four problems you saw on your exam. You *worst question* from you exam (which isn't counted towards you exam grade) will be graded in this homework assignment.

1. Coffee is draining from a conical filter, of height and diameter 6cm, into a cylindrical coffee pot, also of diameter 6cm, at a rate of $10\text{cm}^3/\text{min}$. Calculate how fast the levels in both the pot and the cone are changing when the coffee in the cone is 5cm deep.

2. Assume that sand allowed to pour onto a level surface will form a pile in the shape of a cone, with height equal to the diameter of its base. If sand is poured at $2\text{m}^3/\text{sec}$, how fast is the height of the pile changing when its base is 8m in diameter.

3. We want to construct a box whose base length is 3 times the base width. The material used to build the top and bottom cost \$10 per square foot and the material used to build the sides cost \$6 per square foot. If the box must have a volume of 50ft^3, determine the dimensions that will minimise the cost to build the box.

4. A piece of pipe is being carried down a hallway that is 10 feet wide. At the end of the hallway there is a right-angled turn and the hallway narrows to 8 feet wide. What is the longest pipe that can be carried (always keeping it horizontal) around the turn in the hallway?

The End.