

# Math 2

## The Last Homework Assignment

Due March 9, 2011

March 2, 2011

For this homework assignment, most of the problems are very open ended. Part of the challenge of this homework assignment is to find the math in the problem!

Therefore, *it is imperative that you explain your work, in English, for this homework assignment!* We expect you to:

- Explain any assumptions you made. For example, in the coffee cup problem, what are the dimensions of the cup you used? Was it made of paper or styrofoam? When finding the center of mass, did you assume the cup was full or empty? If full, what was it full of?
- Provide any necessary information that's not provided in the problem. For example, in the coffee cup problem, what is the density of paper (or styrofoam)? What is the density of coffee?
- Explain what math you used, and why. What are you trying to measure with this formula? Why do you think the formula you chose is a reasonable way to measure this quantity?

It is also a good idea (though not required) to do a sanity check of your answer: Does it seem reasonable? For example, the volume of your coffee cup should not be negative (or zero).

---

Without further ado, here are the homework problems. We hope you have fun with these!

1. Find the volume and center of mass of a disposable coffee cup.
2. Ecologists studying the Des Moines River in December 1993 measured the amount of sediment suspended in the river water near the city of Ottumwa, Iowa. Their data are given in the table below.

The ecologists were also able to measure the total amount of sediment moved by the river, by placing a mesh screen in the river to trap the sediment. They found that over the 5-day period of their study, the river moved 1,178,548 kilograms of sediment.

Assuming that the output, or discharge, of the river remained constant over the time period of the study, use the data given to estimate the discharge  $D$  of the river. What units does your answer use?

Date	Suspended Sediment (mg/L)
December 1	18
December 2	35
December 3	58
December 4	64
December 5	66

3. Stewart, page 554, problem 10.
4. Stewart, page 599, problem 14.