Digest 2, Homework 2

(A compilation of emailed homework questions, answered around Wednesday (or, due to the quiz this week, Monday).)

Question. Find the value of a which maximizes the volume of the region in the first octant bounded by $x = a$, $y = 1 - a$, and $z = xy^2$. (As usual, the first octant refers to the region in Euclidean space where $x \geq 0$, $y \geq 0$ and $z \geq 0$.)

(From a student:) I got two different answers for the volume using double and triple integrals. Which is the right one? Also, do I find the maximum volume by taking the derivative?

Answer. In both cases, the answer should be $(1/6)a^2(1-a)^3$. To answer the second question: yes.

Question. (From a student:) What would you recommend studying from the book problems?

Answer. I would recommend doing a few of the easy problems from each section to get going, and then to try an assortment of the harder problems.

Question. (From a student:) Will we have to memorize the double angle formulas and things like that for the exams?

Answer. You certainly cannot forget all of your previous math knowledge, but in the exams I will try to test your understanding of the material in this class with emphasis on concepts, rather than arithmetic or rote memorization. With that said, you will need to memorize a few things sometimes, e.g. that $dxdy = rdrd\theta$. But if a question requires an application of a double angle formula, I will probably remind you of the double angle formula within the question itself. (No guarantees though.) I will give more detailed information about the exams around January 16th, along with my recommendations for studying. For example, being able to re-do all of the homework problems correctly is one part of a good studying plan.

Question. (From a student:) I have the "Early Transcendentals" version of the book. Is this okay?

Answer. I think the usual book and the early transcendentals version have the same final three chapters, so this should be fine.