MA 262 Vector Calculus Spring 2023

Exam 2 Study Guide Part 2

This is an an addendum to the previous study guide, to make it clear that you also need to know Stokes Theorem and the Divergence Theorem.

Conceptual (continued from previous guide):

(1) Parameterized surfaces

(2) Circulation around a surface

(3) Flux across a surface

(4) Stokes Theorem (hypotheses and conclusion!)

(5) Divergence (Gauss) Theorem (hypotheses and conclusion)

Computations (continued from previous guide): You should be able to compute the following. You do not need to actually solve any integrals, but you need to get them to a point where they would make sense to a strong Calc 1 student.

(1) Parameterize a surface obtained by rotating a curve around any axis.

(2) Parameterize a surface that is obtained by joining two curves by line segments.

(3) Parameterize a surface that is the graph of a function $z = f(x, y)$.

(4) Find normal vectors to parameterized surfaces

(5) Find normal vectors to spheres and planes, without using a parameterization

(6) Calculate flux and circulation of a Vector field across or along a surface, using the definition.

(7) Calculate flux and circulation of a Vector field across or along a surface, using Stokes or Divergence Theorem

(8) Calculate flux and circulation of a Vector field across or along a surface, or calculate circulation of a vector field along a curve using Stokes or Divergence Theorem creatively (eg. by integrating over a surface different than the one given.)

Practice Problems (continued from previous guide): These are offered as additional practice, use them to focus on areas where you feel you need more practice. You do not need to work all of them. On the exam, be aware that some problems can be done in multiple ways with one way taking significantly less time than another. Before working any problem, consider what the best approach might be.

(1) Revisit all old homework and quiz problems and work them again. (Don't just look over the problems and solutions)
(2) True/False Exercises for Chapter 7 (p. 522-523)