

MATH 2400, Review suggestions for the final exam

Dear students,

The Final Exam is on Wednesday, May 4 from 10.30am to 1pm (the room is yet to be determined). The exam is cumulative and covers Chapters 9, 10, 11, 12 and 13 of the textbook. For Chapters 9-12 and Sections 13.1-13.4 you can use the review materials for the three midterms. Here are some suggestions for review of the new material (Sections 13.5-13.9).

Spend some time on the Concept Check and True-False Quiz (pg. 974) and the most time on the Exercises. Make sure you understand the formulas and theorems from the textbook highlighted in the red boxes. If you struggle with anything or need to look at the answer before you solve it, make sure you then practice more similar problems until you can do it on your own. Then practice with some of the old exams.

Below is a list of typical problems from each of these sections. The list is not meant to be exhaustive but if you master these problems you should do well on the exam.

CHAPTER 13: VECTOR CALCULUS

Section 13.5: Curl and Divergence.

- Compute the curl and divergence of a vector field.
1 9 EXAMPLE 1 EXAMPLE 4 *pg. 975 #18*
- Decide if a vector field is conservative, and if it is so, then find a potential function.
3 4 EXAMPLES 2, 3 *pg. 975 #11, #12, pg. 947 #17*
- Show that a vector field cannot be the curl of some other vector field.
11 EXAMPLE 5 *pg. 975 #19*
- Use the Green's Theorem (and its vector forms).
12 13 *pg. 975 #17*

Section 13.6: Surface Integrals.

- Compute the surface integral of a function over a surface.
2 4 EXAMPLES 1, 2 *pg. 975 #25, #26*
- Compute the flux of a vector field over a surface.
8 9 10 EXAMPLES 4, 5 *pg. 975 #27, #28*
- How do the above formulas look like when $x = g(y, z)$ is a function of y and z (or when $y = g(x, z)$)?
pg. 960 #26, #27
- Compute the mass and center of mass of a thin lamina in the shape of some surface.
pg. 960 #37, #38

Section 13.7: Stokes' Theorem.

- Use the Stokes' Theorem to calculate a line integral, and a surface integral.
EXAMPLE 1 EXAMPLE 2 *pg. 975 #30, #31*
- Calculate a surface integral by changing to a different surface with the same boundary curve. (see 3 and the discussion on pg. 964)

Section 13.8: The Divergence Theorem.

- Use the Divergence Theorem to calculate flux of a vector field across a closed surface.
EXAMPLES 1, 2 *pg. 975 #32, #34, #36*