

Math 2401, Spring 2012
–Review Sheet for final

The final will be held in the classroom (Howey Physics, L1) on Thursday, 05/03/2012, 8:00 am —10:50 am . You are allowed to use your calculator and one side of one sheet paper (letter size or A4) for formula. The exam will cover the material we have discussed in class and studied in homework for chapters 14, 15, 16, 17, and 18. Please refer to the lecture notes for what I have taught. Review the homework and past quizzes is a good idea. Pay close attention to any questions that you found difficult when you took the quizzes.

For review sheets about chapters 14, 15, and 16, please check the review sheets for midterms. Here is a partial list for the materials we have discussed in the class for chapters 17 and 18.

Thoery

- Defintion of Double and Triple integrals.
- Double integrals as a volume.
- Area as a double integral.
- Properties of double and triple integrals.
- Average value theorems.
- Evaluate double and triple integrals by repeated integrals.
- Polar coordinates
- Volume as a triple integral.
- Cylindrical coordinates.
- Spherical coordinates.
- Jacobians and changing variables in multiple integrals.
- Line integral
- Gradient field and the fundamental theorem of line integral.
- Another notation for line integrals
- Line integrals with respect to arc length.
- Green's theorem and its applications.
- Parametrized surface,
- Surface area.
- Fundamental vector product.
- Secant area formula.

Surface integrals.

Oriented surface.

flux of a vector field.

Vector differential operator.

grad, div, curl, and Laplacian.

Identities for grad, curl and div.

Divergence Theorem.

Stokes' Theorem.

Conditions under which $\nabla \times \mathbf{v} = \mathbf{0}$ implies $\mathbf{v} = \nabla f$.

Applications

For plate, solid, curved wire, and surface:

Total mass, Center of the mass, moment of inertial.

Work along a path.

Potential of a conservative field.

Circulation of a vector field.