Exam 3 Preparation

The exam is scheduled for Wednesday 30 Nov. The exam covers Sections 15.6-16.3. Focus on the list of topics below. There are 9 questions on the exam. For the integral problems, there are some that require only set up and some that require set up and evaluation.

To study for the exam, work problems. Do the quiz problems over again. Do appropriate problems at the end of the chapter.

- Set up and possibly evaluate the surface area integral for a patch of \( z = f(x, y) \) in rectangular or polar coordinates.
- Set up and possibly evaluate triple integrals for the volume of a region using rectangular, cylindrical and spherical coordinates.
- Use the change of variables formula to rewrite an integral (identify the transform variables \( u \) and \( v \), solve for \( x \) and \( y \) in terms of \( u \) and \( v \), compute the Jacobian, and rewrite the integral).
- Parameterize a curve \( C \); set up and possibly evaluate scalar and vector line integrals.
- Conservative fields
  - determine if a vector field \( \mathbf{F}(x, y) \) is conservative.
  - find a potential for a conservative field \( \mathbf{F}(x, y) \) or \( \mathbf{F}(x, y, z) \)
  - use the Fundamental Theorem to compute the vector line integral of a conservative field
- Find the divergence and curl of a vector field