Topics and Book Review for Midterm 2

The suggested problems from the book are not guaranteed to be comprehensive, but should give you a representative workout of your skills.

5.2-4: Double and Triple Integrals
- setting up and evaluating
- changing order of integration (via Fubini or more complicated)

5.5: Change of Variables
- (linear) coordinate transformations
- Jacobian (memorize the three standards)
- recognizing integrals where polar, spherical, or cylindrical coordinates would be useful
- applying a standard or nonstandard coordinate transformation to evaluate an integral

5.6: Applications: mass and average value only

5.7: True/False: #1–8, 12–26

5.8: Extra Problems: #1–3(a), 6, 9–12, 17, 21
- for #10, use $u = y, v = x + 2y$ and be careful with bounds
- for #17, see the last 5.5 lecture example

6.1: Line Integrals
- scalar line integrals
- vector line integrals (work)
- orientation's effect on the each

6.2: Green's Theorem
- original form, curl form (circulation)
- divergence form (flux)

6.3: Conservative Vector Fields
- path independence
- 0 integral on closed curves
- conservative vector field, potential function
- using potential functions to evaluate line integrals
- curl criterion for conservativity
- partial integration

6.4: True/False: #1–7, 10, 11, 15, 16, 19–21, 23–26

6.5: Extra Problems: #2, 5, 21–24, 36