Math 5B, Midterm 2 Review Topics
Fall 2006

Here is a brief list of the key topics we have covered since the first midterm. You should know how to do each thing listed and/or know the definitions of the key concepts. The numbers in parantheses refer to the numbering system in the text. **These are the most important formulas/facts/definitions that you should have memorized and understand how to use.**

- Ch. 2.10: Partial derivatives of implicit functions: (2.61), (2.68)
- Ch. 2.12: Partial derivatives of inverse functions: (2.79), (2.82) and the Jacobian matrix version of (2.82) which is stated just above (2.82), but not numbered.
- Cylindrical and Spherical coordinates: (2.83), (2.84)
- Ch. 2.13: Tangent Vectors (2.90), Tangent Lines to Curves (2.92), Normal Vectors, Gradient (2.103), Tangent Planes to Surfaces (2.100)
- Ch. 2.14: Directional Derivatives (2.115)
- Ch. 2.15, 2.16, 2.18: Higher Order Partial Derivatives (2.124), Laplacian (2.125), Harmonic Functions (2.126)
- Ch. 2.19: Relative Extrema: Theorem on p. 151 (2.146-149), Critical Points, Saddle Points, Extreme Value Theorem (p. 153)
- Ch. 2.20: Lagrange Multipliers: eg. (2.152) or (2.153) and the example.
- Ch. 3.2: Vector Fields (3.1), Scalar Fields
- Ch. 3.3: Gradient (3.8), the "del" operator ∇ (3.7)
- Ch. 3.4: Divergence (3.15), (3.16)
- Ch. 3.5: Curl (3.23), (3.24)
- Ch. 3.6: Combined Operations: (3.29), (3.30), (3.31), (3.33) (good to know, but less important are (3.35-6).)