Infinitesimal Calculus 3

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- Basic concepts of topology of metric spaces: open and closed sets, connectedness, compactness, completeness.
- Normed spaces and inner product spaces. All norms on $\mathbb{R}^n$ are equivalent.
- Theorem on existence of a unique fixed point for a contraction mapping on a complete metric space.
- Open mapping theorem and implicit function theorem. Lagrange multipliers. Maxima and minima problems.
- Fubini theorem. Jacobian and the change of variables formula.
- Path integrals. Closed and exact forms. Green’s theorem.
- Time permitting, surface integrals, Stokes’s theorem, Gauss’ theorem.