Math 15300/14 lectures outline

I will update this document after every lecture to keep track of what we covered, and to indicate what I plan to cover in the next lecture.

Week 1

1/7/20.

- limits at infinity
- (ϵ, K)-definition of limit

1/9/20. Sections 11.2, 11.3

- basic properties of sequences (increasing, nonincreasing, monotonic, bounded above, etc.)
- convergence of sequence

Week 2

1/14/20. Sections 11.3, 11.5 (skip Theorem 11.5.2), 11.6

- convergent/divergent sequences
- L'Hôpital's rule

1/16/20. Sections 11.4, 11.7

- limits of some particular potentially useful sequences
- improper integrals with unbounded intervals

Week 3

1/21/20. Sections 11.7, 12.1, 12.2

- improper integrals with unbounded functions
- infinite series

1/23/20. Sections 12.2

- infinite series
- some examples (geometric, telescoping)
- basic properties

Week 4

1/28/20. Midterm

1/30/20. Section 12.3

- tests for series convergence

Week 5

2/4/20. Section 12.3, 12.5

- more test for series convergence

2/6/20. Section 13.1, 13.2

- 3D coordinate system and vectors

Week 6

2/11/20. Section 13.2, 13.3, 13.5

- dot products (geometric interpretation)
- projections
- lines in 2D and 3D

2/13/20. Section 13.5, 13.6

- lines and planes

Week 7

2/18/20. Section 15.1, 15.3

- functions of several variables
- graphs
- level curves, level surfaces

2/20/20. Midterm

Week 8

2/25/20. Section 15.4, 15.6

- partial derivatives
- continuity
- mixed partial derivatives

2/27/20. Section 16.1, 16.2

- differentiability
- directional derivatives

Week 9

3/3/20. Section 16.2, 16.3

- directional derivative
- direction of steepest ascent
- chain rule

3/5/20. Section 16.4, 17.2

- gradients and level curves
- integration

Week 10

3/10/20. Section 17.3

- area of cross sections
- double integrals and volume