

Topics to Midterm 2

Math 4181H

The exam is on Monday, October 20. During the exam you can use books and notes, both paper and electronic. The exam will consist of 4-6 problems related to some of the following topics:

1. Limits of sequences
2. Properties of converging sequences and their limits: uniqueness, inequalities, squeeze theorem, arithmetical properties
3. Infinite limits
4. Some standard limits
5. Monotone sequences
6. Number e
7. Cauchy criterion of convergence
8. Subsequences and limit points
9. The Bolzano-Weierstrass theorem
10. \limsup and \liminf
11. The limit of a function at a limit point of its domain, ε - δ and sequential definitions
12. Properties of limits: uniqueness, inequalities, squeeze theorem, arithmetical properties
13. Limit of the composition
14. Infinite limits, one-sided limits, limits at infinity
15. Limits of a monotone function
16. The Cauchy criterion for functional limits
17. Functions, continuous at a point
18. Properties of functions, continuous at a point
19. Kinds of discontinuity
20. Discontinuities of a monotone function
21. The inverse of a function strictly monotone on an interval
22. The intermediate value theorem and its corollaries
23. Max/min values of a function continuous on a closed bounded interval
24. Uniformly continuous functions
25. Extension of a uniformly continuous function by continuity
26. The exponential, logarithmic and power functions