Topics to Midterm 1   Math 4181H

The exam is on Monday, September 22. During the exam you can use books and notes, both paper and electronic. The exam will consist of 6-8 problems related to some of the following topics:

1. Axioms of real numbers
2. Elementary properties of real numbers
3. Absolute value and its properties
4. Existence of $\sqrt{a}$
5. Classical ineqialities: mean, triangle, Schwarz
6. Natural numbers and induction
7. The Archimedian property
8. Inductive definitions, powers a^n
9. Bernoulli's inequality
10. Binomial coefficients and the binomial formula
11. Complete induction and well ordering of $\mathbb{N}$
12. Integers, divisibility, prime and coprime integers
13. The fundamental theorem of arithmetic
14. Rational numbers
15. Irrationality of $\sqrt{2}$
16. Intervals, neighborhoods, limit points, dense sets
17. Denseness of $\mathbb{Q}$ in $\mathbb{R}$
18. $\pm\infty$
19. sup and inf
20. The nested intervals principle
21. Base d numerical systems
22. Existence and uniqueness of $\mathbb{R}$, Dedekind cuts
23. Cardinalities, countable and uncountable sets, Cantor's theorem
24. Cantor's set