Math 200-01

Final Exam Information

The 1st final exam is Wednesday, May 4, during class. The 2nd final exam is Monday, May 16, 5pm–6:50pm, in Room 2625. Special office hours during finals week:

- Monday, May 16: 3:00pm – 5:00pm
- Tuesday, May 17: 12:00pm – 2:00pm
- Wednesday, May 18: 12:00pm – 1:00pm

Skills Checklist

1. Be prepared to state Polya's four steps.
2. Be prepared to explain a number of different strategies for applying any given one of Polya's four steps.
3. Be prepared to give several examples of problems (especially elem school problems) and describe how Polya's steps are involved in the solution processes.
4. Be prepared to explain how a specific step (of Polya's four) can be applied to a given problem.
5. Be able to explain how and why a specific strategy is related to one of Polya's steps.
6. Be prepared to use Polya's steps to solve a problem.
7. Be prepared to continue patterns and explain your reasoning.
8. Explain the difference between inductive and deductive reasoning. Use both kinds of reasoning in problem solving.
9. Find counterexamples to disprove conjectures.
10. Find the nth term of an arithmetic sequence. Find any specific term of an arithmetic sequence and the sum of any number of terms.
11. Find terms of a recursively-defined sequence.
12. Find the nth term of a geometric sequence.
13. Determine whether a sequence has a constant first, second, or third difference. Find several terms of the sequence to continue the pattern.
14. Determine whether a set is well defined.
15. Determine whether a given object is an element of a certain set.
16. Write sets in roster (listing) notation or in set-builder notation.
17. Demonstrate the proper use of the symbols of set theory.

18. Determine whether sets are equal. Determine whether sets are in a one-to-one correspondence.
19. Determine subsets of a given set. Determine whether one set is a subset of another.
20. Determine the cardinality of a set.
21. Find the complement of a set.
22. Find examples of sets that satisfy certain conditions.
23. Use Venn diagrams to illustrate subsets, complements, and their relationships.
24. Find unions and intersection of groups of sets.
25. Determine relative complements (differences of sets).
26. Use Venn diagrams to prove set identities.
27. Shade the region of a Venn diagram corresponding to a given combination of sets.
28. Use set notation to name the shaded region of a Venn diagram.
29. Solve application problems using two- or three-set Venn diagrams.
30. Find the Cartesian product of two sets.
31. Give real-world applications of set unions, intersections, differences, and products.
32. State and explain the basic properties of the Hindu-Arabic numeration system.
33. Write a number in expanded form.
34. Represent a number in any base using base blocks.
35. Convert a number from another base to base ten.
36. Convert a base-ten number to another base.
37. Write the counting numbers in any base.
38. Know several models for each of the whole number operations: addition, subtraction, multiplication, and division.
39. Know and use the correct order of operations.
40. In addition to the standard algorithms, you should know how to use several nonstandard algorithms to add, subtract, multiply, or divide whole numbers.
41. Be able to carry out addition and multiplication in bases other than 10 and illustrate your procedure with base blocks.
42. Know and use the commutative, associative, and distributive properties.
43. Know several models for integer addition, subtraction, multiplication, and division.

44. Be able to rewrite subtraction and division problems in terms of addition and multiplication.

45. Explain why division by zero is not defined.

46. State the rules for adding, subtracting, multiplying, or dividing signed numbers. Give examples to illustrate the rules.

47. Know the definition of "divides" and be able to use theorems 5–12 and 5–13.

48. Know and apply the divisibility tests for 2, 3, 4, 5, 6, 8, 9, 10, and 11.

49. Find prime factorizations.

50. Determine whether a number is prime or composite.

51. Use the Sieve of Eratosthenes to determine all primes less than or equal to n.

52. Use the prime factorization to determine the number of positive divisors on an integer.

53. Compute LCMs and GCDs. Know and use the formula $\text{LCM}(a, b) \cdot \text{GCD}(a, b) = ab$.

In addition to everything listed above, the second final exam will also cover the following skills.

1. Perform operations on rational numbers (including improper fractions and mixed numbers).

2. Use figures to describe fractions and the operations of addition, subtraction, multiplication, and division.

3. Estimate the values of fractions and judge the reasonableness of your estimate.

4. Write fractions as terminating or repeating decimals.

5. Know the difference between the following sets of numbers: natural numbers, whole numbers, integers, rational numbers, and irrational numbers.