Test 2 Study Sheet

Math 100 – Spring 2001

You should look over the sections from the book that were covered, your notes from class, and the assignments that were given since Test 1. You might also like to look over the first test to remind yourself of my style of test-writing. Here is a list of topics covered that you can use to help you make sure don't forget something.

Geomtric Topics: Sections 4.1, 4.3, 4.5

- Pythagorean Theorem (statement, proof, applications)
- Golden Rectangle (definition, φ again, logarithmic spiral, relation to Fibonacci numbers)
- Platonic Solids (definition, examples, table on p. 275, how to use arithmetic to help you "count", duality)

Rational, Irrationals and Decimals: Sections 2.6 and 2.7

- Rational numbers (why they're called rational numbers, fractions, finding a rational between any two rationals, decimal representations, converting between fraction and decimal representations, why rational numbers all have decimal expansions that terminate or repeat)
- Real numbers (decimal representations of rational and irrational numbers, examples of irrational numbers, proof that $\sqrt{2}$ is irrational and how to modify it to work for other numbers, how to tell if a decimal representation is a rational or irrational)

Infinity: Sections 3.1–3.5

- Cardinality (definition of "same cardinality" in terms of one-to-one correspondences, relationship to counting, identifying proposed correspondences as one-to-one or showing the mistake, two kinds of mistakes that can be made)
- Examples of things that have the same cardinality as the natural numbers (naturals minus one or two numbers, evens, odds, rationals, Hilbert's Hotel(s)/Hotel Cardinality, etc. and how to show they have the same cardinality)
- Set of real numbers is "bigger" than set of natural numbers (diagonal proof & the missing number, why we should avoid using 9's to build the missing number, similarities to dodgeball)
- Geometric correspondences (how to show that two geometric objects have a one-to-one correspondence between points, stereographic projection)
- Infinity (infinity is not a number, more than one "size" of infinity, ways in which infinity does not behave like finite things)
- Cantor's proof (subset, powerset, there is no largest set, diagonal proof & the missing subset, similarities to dodgeball)