

MATH 526 GEOMETRY, NUMBERS, AND ALGEBRA

Fall 2008/Spring 2009 (Revised)

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TEXT: Notes provided by the instructor.

MATERIALS: Compass; small protractor; 3" or 4" diameter styrofoam ball; fine yarn, string, or thread (various colors); map pins; scientific calculator with trig functions, inverse trig functions, $\ln(= INVe^x)$ function.

SYLLABUS: A comparative survey of geometric and algebraic concepts.

Fall 2008: Lines, distance, angles, and triangles in the Euclidean (\mathbb{E}), Hyperbolic (\mathbb{H}), and Spherical (\mathbb{S}) planes.

Spring 2009: Angle sums, similarity and non-similarity of triangles. Number fields, domains, and polynomials. Division, prime factorization, and congruences for integers and polynomials. Complex numbers.

COURSE OBJECTIVES:

To gain understanding and skills for:

analysis and reasoned explanation in general, and for mathematics in particular;

relating various geometric and algebraic concepts to one another;

constructing examples and placing them in context;

inferring general principles from the study of examples;

articulating and communicating problem solutions, verbally and in writing;

reformulating any of the above, when appropriate, for teaching middle school students.

GRADING SYSTEM:

Homework/In-class projects	=	300 points
One in-class exam each semester (50 points each)	=	100 points
One take-home exam each semester (50 points each)	=	100 points
<hr/> TOTAL	=	500 points

Any curves for each component will be added to obtain the overall scale.

Consulting with peers on homework is allowed (even encouraged). But except for assignments that are specifically designated as group projects, please write up your work independently (and neatly).