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Syllabus
Mathematics 7 - Algebra 1
2011-2012

Course Description

We begin with a study of the integers, including prime numbers, prime factorization, divisors, multiples, the divisor theorem, positive and negative integers, absolute value, and order. Students practice the basic principles of algebraic manipulation by solving equations in one unknown and work many word problems using formal algebra. Students learn about the coordinate plane, practicing plotting points and graphing lines. The idea of a function is informally introduced when direct and inverse variation are discussed in the context of word problems. Students work with functions represented by tables, graphs, and equations. The correspondence of a function's algebraic and graphic representations is emphasized. Students calculate and simplify expressions involving the four arithmetic operations, learn to multiply and divide polynomials and monomials, and practice transforming equations. Students begin to write simple proofs, demonstrating some of the properties of numbers by using algebraic expressions.

Core Goals

- Explore the integers by using the Fundamental Theorem of Arithmetic, which says that every integer is either a prime number or may be written as a unique product of prime numbers
- Use prime factorization to solve problems concerning the divisibility of integers, including finding the least common multiple and greatest common divisor of a collection of integers
- Acquire an intuitive sense of the fundamental laws of algebra and an appreciation that these laws must be precisely as they are
- Learn to read the meaning of a mathematical expression rather than the printed signs and symbols
- Acquire formal skill in manipulating basic algebraic expressions and solving linear equations for an unknown
- Understand mathematical relationships between variables in an equation both algebraically and geometrically in the coordinate plane
- Learn the roles played in mathematics by axioms and definitions

Expectations

Take notes. In mathematics class, every important point is made *both* audibly in spoken words *and* visually in words, symbols, and drawings that go on the board. When you take notes on a solution, derivation, or proof, you think through the mathematics along with your teacher. Taking notes raises your understanding to a higher level, because you interpret, judge, evaluate, and organize what you are seeing and hearing in class while it is happening.

Do homework. Your success in this course depends on your thoughtfully preparing assignments in time for the next class, in which we will discuss your comments and answer your questions about the assignment you completed. Since each class builds upon the previous one, missing an assignment will leave you unable to follow and understand the material presented in the next class. This cascading effect once begun is hard to stop.

Expect to spend about 3 hours per week outside of class seriously working on mathematics without distractions. If you stick to this, you will find you hardly need to study before and exam, because you will already know the material.

Textbook & Resources

Japanese grade 7 Mathematics. Kunihiko Kodaira, editor.

Web

I maintain a web site at www.math.mnrt.net . This is a valuable resource. If you are absent, you can get the day's assignment and any handouts from class at this site. I update the site every weekday almost always by 5:30 PM.

Here you will find

- the current assignment and all past assignments,
- copies of everything handed out in class including problem sets, and solutions to selected problems, but not including in-class exams and quizzes,
- my notes when the day's topic was especially complex,
- links to sites of mathematical interest.

This is not intended as a substitute for keeping an assignment notebook, which you are required to do. If you are absent from class, check here for the day's assignment and any handouts provided during class. Parents will find the definitive answer to the question: "Do you have any mathematics homework?"

Required Materials

An organized three-ring binder with five divider tabs for class notes, handouts, homework, quizzes, and exams; a red correcting pencil; several sharpened pencils; and a good quality eraser are required. Bring these items, along with your textbook and completed assignment, to class each day.

Course Outline

- The Integers: prime numbers, prime factors, common divisors, common multiples, greatest common divisor, least common multiple, addition, subtraction, multiplication, and division of signed numbers
- Letters and expressions, evaluating expressions, calculating linear expressions; rational expressions
- Solving linear equations, including rational equations
- Equations involving simple proportion: rate of change, direct and inverse proportion, graphing functions on the coordinate plane
- Monomials and polynomials: addition, subtraction, multiplication; exponential expressions

Grading & Evaluation

Your trimester mastery grade is determined by full period exams, brief quizzes, and any graded assignments. Your scores on quizzes will make up 20% of your trimester grade. Exams and graded assignments will make up 80%. Exams and quizzes will have strict time limits, because they seek to assess your level of proficiency with the material that we recently covered. Proficiency often means that you can work a problem in a couple of minutes using the recent material we covered, rather than suffering 15 minutes of furious labor because you were unfamiliar with the recent material we covered.

It's a fact: homework is the single most important ingredient in determining your grade on examinations and quizzes, and therefore your course grade. If you slack off on homework, you will get a poor course grade.

A quiz may be given at any time without prior announcement. Expect a short quiz about once per week. Your lowest quiz score will be dropped. Exams will be announced well in advance and will require a full class period to complete.

Absence Policy

If you are absent for a quiz or an exam, *you* are expected to arrange to make it up. If you miss a class meeting, borrow another student's notes to copy. Discussing those notes with the other student will further benefit both you and your kind classmate.

Late Work Policy

Homework is considered practice, so you will not be graded on it. There will be some graded assignments including take-home exams. The MCDS High School late work policy will apply to graded assignments. This policy states that for each day work is late, 10% will be deducted from the grade, up to 50%. If the work is never turned in, it will count as zero.

Getting Help

Please seek my help outside of class. I teach because I love to do mathematics with you. The student who makes the extra effort to get help when needed makes a very good impression on the teacher. Do not expect the impossible, though. If you have not kept up with assignments, meeting with me for an hour as the exam date approaches is not going to do you much good. If that was all it would take for you to do well, I would not be giving all these assignments in the first place. Remember that asking specific questions rather than saying, "I don't get it" will bring you the most useful help as well as evidence the effort you made in trying to master the material.

Signature

I have read and discussed this syllabus with my child _____
Parent's Signature

I have read and discussed this syllabus with my parent(s) _____
Student's Signature