Course name: Introduction to Number Theory

Course description

"Introduction to Number Theory", is designated for students who have completed an Algebra 1 course. This course covers fundamental principles of number theory, including primes and composites, divisors and multiples, divisitulity, remainders, modular arithmetic, and number bases.

This course is specifically designed for high-performing students and draws material from many programs for top middle school students. Our goal is to help students to develop more by learning to solve problems they haven't seen before.

This is one semester, 16 weeks course.

Who should take this course

Students are ready for this class if they have mastered linear equation and related, quadratic equation and related, fraction equation and related, graphs of special relations, such as linear function, quadratic function, exponent function, etc. Students who have completed a typical Algebra 1 course are ready for this section.

The requirement for students who register this course

In general, students in grade 7 – 9 are eligible to register this course. All students who want to take this course should pass the evaluation test called "Are You Ready?". Besides, students who are interested in this course should take another test as well. It is called "Do You Know?" Both tests would give you an idea of whether this course is fit to you and meets your requirement. Test questions are posted in NCLS website.

Even though successful registration to the class, the students may be asked to change to appropriate class if the student has difficulties to understand the contents, or is not able to complete practices or assignments, or couldn't pass the quiz test, etc.

Text book:

AOPS, "Introduction to Number Theory", by Mathew Crawford

Purchase textbook online: https://artofproblemsolving.com/store/item/intro-number-theory

Course contents:

1. Integers, fractions, decimals, and number bases
2. Base number arithmetic
3. Multiples, divisors, and prime numbers

4. Common factors, common multiples, Euclidean algorithm
5. Divisor problems, more with the Euclidean algorithm
6. Factorials, special integers, algebra with integers
7. Units digit, introduction to modular arithmetic
8. Calculations with modular arithmetic
9. Divisibility rules and multiplicative inverses
10. Multiplicative inverses, solving linear congruence
11. Systems of linear congruence and the Chinese remainder theorem
12. Number sense and applications of number theory