The Program

June 8-25, 2015
Monday - Thursday
8:30 AM - 4:00 PM

The program consists of four parts: (1) a three- week long class, "Explorations in Number Theory," (2) lunch, where participants get to know each other and the program staff, and where they have the opportunity to discuss mathematics in an informal setting, (3) an afternoon colloquium series with talks on a variety of topics, (4) a computer lab, where students will explore number-theoretic questions using the flexible and powerful Python language (no background in Python needed).

The morning class is a rapid three-week introduction to number theory, one of the important applications of which is cryptography, the science of sending secret messages. Cryptography and the number theory it depends on is an active area of research which is vital to our national security. Students will learn to encode and decode messages which they send to each other. We will also cover continued fractions, elliptic curves, and various other topics.

Problem sessions are integrated into the morning class. Participants work both individually and in groups and are assisted by program staff, including faculty and graduate and undergraduate students. These sessions give all participants direct experience in problem solving and in communicating the results of their work.

The afternoon talks cover topics such as mathematical biology, probability and statistics, history of mathematics, and fractals. They give students an idea of the great range of ideas, problems, and applications in mathematics.

The lunch break provides students with an opportunity to get to know each other and the program staff outside the classroom.

Theorem (Euclid):
There are infinitely many primes

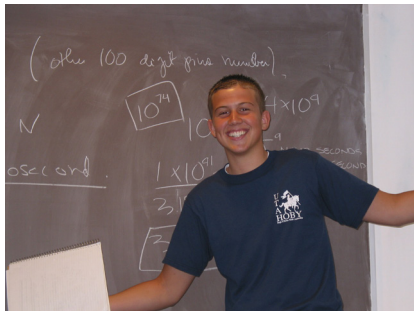
University of Utah
Department of Mathematics

Summer Mathematics Program for High School Students

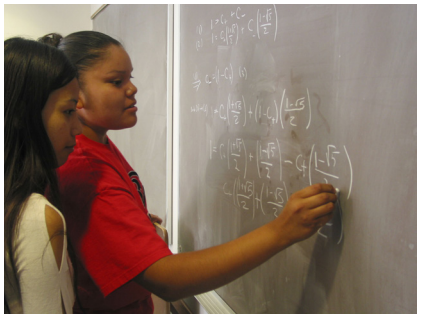
Goldbach Conjecture:
Every even number greater than 2 can be written as the sum of two primes.

$$100 = 53 + 47$$

The **Summer Mathematics Program for High School Students** at the University of Utah provides outstanding students an opportunity to develop their talents to the fullest. By presenting intriguing puzzles, challenging problems and powerful ideas, the program stimulates curiosity, develops the intellect, and lays a strong foundation for future work in mathematics, the sciences, or science related careers.



Students are actively engaged in the learning process.



3.14159265358979323846264338327950288419716939937510

- Participants will receive three university credits in mathematics (graded credit/ no credit).
- The prerequisite for the program is precalculus. Calculus is not required.
- Preference will be given to students between their junior and senior years.
- Program costs for US citizens, nationals, and permanent residents are paid by an American Mathematical Society Epsilon Fund Grant for Young Scholars Programs and the U of U Department of Mathematics.

Find at least three positive integer solutions to the equation:

$$x^2 - 103y^2 = 1$$

Contact Information

For more information contact:
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Application Deadline:
March 31, 2015

Please send all application materials to "Summer Mathematics Program for High School Students" at the address above.