Math Colloquium

Problem solving strategies are often based on considering so-called heuristic principles that have the potential to be used in a solution of a problem. In this talk **Dr. Jacek Fabrykowski,** Professor of Mathematics at Youngstown State University, will use examples to illustrate heuristic principles such as: the Box Principle (a.k.a. Pigeonhole Principle), the Invariance Principle, the Interpretation Principle, the Principle of Specification and Generalization, and Coloring Proofs. You'll discover that each of these principles can be used to solve problems that come from a variety of different mathematical fields.

"Problem Solving Strategies"

Presenter: Dr. Jacek Fabrykowski
Date: **Monday, November 1st**
Time: 3:45
Place: SAC 216

Refreshments at 3:30.

Math Help Center is Open for Business

MATH HELP CENTER
Mon, Tues, Wed, & Thur

7 – 10 p.m.
SAC 215

Winter Term Math Courses

Winter term registration begins on November 8, and we thought you might like to know something about the upper-level math courses we're offering. If you have any questions about these courses, please talk to the professor.

MTH 223 *Math Structures* **(Sipka)**
The title of this *required* course should really be: *How To Write Proofs*. You'll learn lots of techniques and get lots of practice writing proofs.

MTH 323 *Complex Analysis* **(Dai)**
Virtually all of your work up to now has been in the real world; that is, the world of real variables. This course will explore the world of functions of a single complex variable. This is a great elective course, especially for physics majors.

MTH 351 *Number Theory* **(Molina)**
You probably won't see a fraction (or decimal) in this course, and you definitely won't see an irrational number. This course will focus on integers and the many interesting properties they possess. Another great elective that is simply good for the soul.

MTH 411 *College Geometry* **(Putz)**
You'll do lots of proofs in this course, and you'll be introduced to some interesting and strange worlds where rectangles don't exist and all triangles have angle sum less than $180°$. This is a *required* course for all math-teaching majors.

MTH 431 *Advanced Calculus* **(Nyman)**
In this course you'll examine closely many of the topics covered in calc 1 and 2. You'll look in-depth at topics such as limits, derivatives, integrals, and infinite series. All majors are *required* to take either MTH 431 OR MTH 421.

Benoit Mandelbrot Passes Away

At age 85, **Benoit Mandelbrot**, founder of the Mandelbrot set, died of pancreatic cancer on October 14th. Mandelbrot was born in Warsaw, Poland where two of his uncles introduced him to mathematics. In 1936, he and his Jewish family went from Poland to Paris, escaping the threat that Nazi Germany imposed. When World War II started, he moved to Tulle where Rabbi David Feuerwerker helped Mandelbrot keep up his mathematical study. He returned to Paris in 1944 and began studies at Ecole Polytechnique one year later. He earned his masters degree in aeronautics at California Institute of Technology and his Ph.D. in mathematics at the University of Paris. After marrying Aliette Kegan, Mandelbrot moved back to the United States to join IBM Research Center's staff where he became an IBM Fellow. The Mandelbrot set came to be in 1979. Benoit Mandelbrot has largely innovated original perceptions in mathematics. He had a brilliant and beautiful mind, and we shall miss him. S^2

What is the Mandelbrot set?

The Mandelbrot set is a mathematical set of points in the complex plane, the boundary of which forms a fractal. A fractal is a rough or fragmented geometric shape that can be split into parts, each of which is approximately a reduced size copy of the whole. The Mandelbrot set was made famous by **Benoit Mandelbrot**, and has become popular outside of mathematics because of its aesthetic appeal. On March 1st, 1980, at IBM's Thomas J. Watson Research Center in upstate New York, Mandelbrot first saw a visualization of the set. M^2
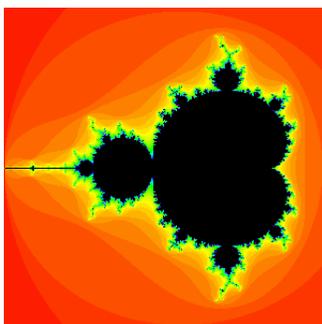
Puzzle of the Bi-week

A square is inscribed in a circle, which is inscribed in another square. Find the **ratio of the areas** of the two squares.
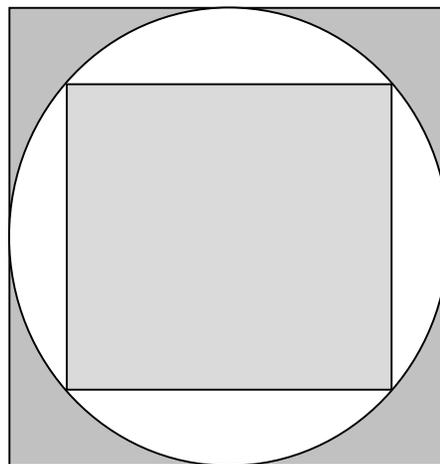
If you would like to submit an announcement or a short article, please send it via e-mail to Matt Mansell (11mgmans) or Tim Sipka (sipka).