Lecture 15: Polynomials — Math 345

Monday, October 18, 2010 — Jim Fowler

Textbook

This lecture discusses section 4 of the textbook.

Homework

The homework is due Thursday, October 21, 2010. From Section 4 of the textbook, do exercises 17, 18.

A message from Professor Falkner

Dear Math 345 Student,

Are you currently majoring in mathematics? If not, are you considering it? If you answered yes to either question, then I would like you to know about an opportunity to get acquainted with a faculty member in the Department of Mathematics whom you might eventually decide you would like to have as your advisor for your major program. A number of mathematics professors are offering to meet this quarter with up to five students each to lead a five-session series of mathematics-related activities. Each of the professors has proposed a different series of activities that they hope will interest students. I strongly encourage you to participate in one of these activities that interests you if your schedule permits it.

an impassioned plea to major in mathematics

humorous example

$n^2 + n + 41$ is a prime for each $n \in \mathbb{N}$?

try $n = 41$.

there are infinitely many prime numbers

also, there are infinitely many composite numbers! :-)

Solving congruences?

quadratic polynomials

Let $a, b \in \mathbb{Z}$.

Suppose $x^2 + ax + b = 0$ and $x \in \mathbb{Q}$.

What can we say about x?

third degree polynomials

Let $r, s, t \in \mathbb{Z}$.

Suppose $x^3 = rx^2 + sx + t$.

Show that if x is rational, x is an integer.