Lecture 16: Induction — Math 345

Wednesday, October 20, 2010 — Jim Fowler

Textbook

This lecture discusses section 5 of the textbook.

Homework

The homework is due Monday, October 25, 2010.
From Section 5 of the textbook, do exercises 1 and 3.

I will have your exams graded by Thursday

on Thursday, I will give you a summary of how you did

the principle of math induction

as an axiom schema: let $P(n)$ be a statement about a natural number n. If $P(1)$ and whenever $P(n)$ then $P(n+1)$ is true, then $P(n)$ for all n.

examples

sum of first n odd numbers
sum of the first n numbers
sum of the first n squares
$n^3 + 2n$ is divisible by 3.
number of ways of covering an $n \times 2$ board with dominoes

bad example

all horses have the same color

induction is what lets us say something about the natural numbers