Assignment #4 for **Mathematics for Economists**
Economics 362M, Spring 2010

Due date: Tue. Feb. 16.
Readings: CSZ, Ch. 2.10, Ch. 3.1-2.

We now begin studying the mathematics of infinite sets. Whether or not the universe is infinite, the mathematics of infinite sets is often much easier than the corresponding mathematics of finite sets — consider trying to do planar geometry under the "simplifying" assumption that there are $3.46 \cdot 10^{29}$ (or so) points in the plane. The first step, Ch. 2.10, is understanding the definitions of the different sizes of infinite sets and learning how to use them. The second step is to understand the properties of the "rational" numbers, $\mathbb{Q}$. Here the adjective "rational" does not mean "complete and transitive," as it would if it modified a preference relation. Rather, it means "a number which is a ratio of elements of $\mathbb{Z}$.

Problems to do

From Chapter 2.10: 2.10.2 and 3 (p. 56).
From Chapter 2.10: 2.10.11 and 13 (p. 58).
From Chapter 2.10: 2.10.17 (p. 60).
From Chapter 3.2: 3.2.2 (p. 74).
From Chapter 3.3: 3.3.2 (p. 75).

Assignment #5 for **Mathematics for Economists**
Economics 362M, Spring 2010

Due date: Thu. March 4.

Here we introduce Cauchy sequences of rationals as a way to fill in the holes in $\mathbb{Q}$. One very easy way to think of this material is that it gives us the infinite length decimal expansions.

From Chapter 3.3: 3.3.10 (p. 77)
From Chapter 3.3: 3.3.14, 16, and 17 (p. 78)
From Chapter 3.3: 3.3.22 (p. 80)
From Chapter 3.3: 3.3.31 (p. 82)
From Chapter 3.4: 3.4.2 (p. 83)
From Chapter 3.4: 3.4.7 and 12 (p. 84)
From Chapter 3.5: 3.5.3 (p. 88)