5.95 (Spring 2009)

Homework 2

Due in class on ***Tuesday, 03 March 2009****.*

1. **Reading**
   On the website (**mit.edu/5.95**) I've placed three readings about misconceptions and rote learning:

   1. Selection from Liping Ma (1999), *Knowing and Teaching Elementary Mathematics: Teachers' Understanding of Fundamental Mathematics in China and the United States*, Lawrence Erlbaum. The selection is extensive for the curious; for our purposes, skim or read Chapter 3 (division by fractions).

   2. Frederick Reif (1995), Millikan Lecture 1994: Understanding and teaching important scientific thought processes, *American Journal of Physics* 63:17–32.

   3. Gerd Gigerenzer, Wolfgang Gaissmaier, Elke Kurz-Milcke, Lisa M. Schwartz, and Steven Woloshin (2008), Helping doctors and patients make sense of health statistics, *Psychological Science in the Public Interest* 8(2):53–96.

   Skim them, then choose your favorite to read more carefully (feel free to choose more than one if you are inspired), and write a question about it for yourself (no need to turn it in).

2. **Identify a misconception**
   Identify a misconception that you have seen in students (or in yourself), and describe it on an index card. Turn in the index card in class.

3. **Teaching equations**
   Choose one of the equations from Homework 1, or choose another equation that you might teach or would like to teach. Then plan and write out how you would teach it so that students get interested in it and are likely to understand and learn it.

   Bring your 'equation treatment' to class. In class you'll give your treatment to a randomly chosen member of the class. So be sure to write your name and email address on it, and make your discussion of the equation and your pedagogical reasoning understandable to someone who might not be an expert in your field.

   For the followup assignment, the recipient will help you improve your writeup, and you'll do the same for someone else.