MA 310 001, SPRING 2011.

- Problem solving lunch. Any interest?
- Several students asked for additional practice with mathematical induction.

  Here it is:

  1. Show that $\sum_{k=1}^{n}(3k+2) = \frac{n(3n+7)}{2}$ holds for $n = 1, 2, 3, \ldots$.
  2. If we know that $\sum_{k=1}^{n}(5k-3) = \frac{(5n-1)n}{2}$, find the sum $\sum_{k=1}^{n+1}(5k-3)$.
  3. Find a simple formula for $\sum_{k=1}^{n}(4k+1)$. Use induction to prove that your formula is correct. Find another way to show that your formula is correct.
  4. Show that

$$(1-\frac{1}{4})(1-\frac{1}{9})(1-\frac{1}{16})\ldots(1-\frac{1}{n^2}) = \frac{(n+1)}{2n}.$$

- Friday, 11 February 2011. Hand in #6 and 9 from section 1.2. We will continue working on set 1.3.
- Monday, 14 February 2011. Review for exam. Please bring questions about sets 1.1 and 1.2. Continue working on set 1.3.

  For the exam, you should make sure you have a good understanding of all of the problems in sets 1.1 and 1.2. In addition, review the reading §1-17 in part I of Polya and pages 9–20 of Courant and Robbins.
- Wednesday, 16 February 2011. Exam 1.
- Friday, 18 February 2011. Read about the binomial theorem on pages 16 and 17 of Courant and Robbins.
- Monday, 21 February 2011. Hand in problems 3 and 9 from set 1.3.
- Due Friday, 25 February 2011. Read the article by Boaler, Open and closed mathematics: student experiences and understandings, J. Research in Math. Education. volume 29 (1998), pp. 41–62. Available at

  `http://www.jstor.org/stable/749717`

  from an on-campus computer or by a link from the course home page at

  `http://www.math.uky.edu/~rbrown/courses/ma310.s.11/`

which includes a link that might work from off-campus with a link blue login. Please access the article early and I do not guarantee that off-campus access will work.

On page 43, Boaler writes that she will investigate a process-based mathematical environment. Describe what this means. Use examples. Give at least two advantages from the article of such an environment and two likely criticisms.

I expect that two hand-written pages will be sufficient.

February 21, 2011