Math 117
Homework 1 Comments

Each problem is worth 2 points. A grade of 0 indicates no solution or a substantially wrong solution. A grade of 2 indicates a correct or nearly correct solution. Otherwise the grade given is 1.

The total number of points for this homework was 20, but the homework is worth 10 points on MyUCLA, so I divided the score by 2 and then rounded up.

If you believe a problem was misgraded, or I made some addition or other error, please write a short note explaining the situation, attach it to your homework, and return it to me (either in person, in my mailbox, or under my office door). I'll take a look and afterwards leave your homework in a box outside my office.

The following are comments for the graded problems.

General Comments

1. Many of the solutions were so terse that I had trouble following what you were trying to do. Please don't be stingy with using words to explain clearly each step. It's generally better to explain too much than too little. I will be grading the midterms and will take off points if your proofs are hard to follow.
2. For problems I do in section, please try to understand what I've done and write a good proof in your own words. Those who just copy what I write on the board (which is often not everything you need to write–some of it I don't write down but just say aloud, to save time) and give no indication that they really understood what went on generally will get at most 1 point for the problem.

1

E2. If you had trouble with this problem, make sure you understand the solution.

E3. See General Comment 2.

2A

E3. This one is just like Example 3 in the text, so I wasn't very lenient with grading here.

E4. I only graded part (i). I noticed, however, that many people used induction to prove part (ii) when all you need to do is plug into the equation you just proved in part (i). See also General Comment 2.

E5. I also only graded part (i) here. See General Comment 2.

2B

E3. Most people just followed what we did in section. I don't like this problem at all, though, so I was very lenient grading it. If you did anything that looked close to correct I gave full credit.

E5. I only graded part (b) of this problem. Most people were unable to do this problem, and I'm sorry we didn't have time to go over it in section. Please read the solution and understand it.

2C

E3. We went over this in section, but I neglected to point out one subtlety: The set T could contain negative numbers, and technically the Well-Ordering Principle applies only to sets of natural numbers. However actually any set S of integers with a lower bound $b \leq 0$ also has a least element: Just note that there's an order-preserving bijection between S and the set $T = \{n - b + 1 : n \in S\}$, and that $T \subseteq \mathbb{N}$. Furthermore a least element of T corresponds to a least element of S.

In any case, I didn't mark off for this. Note that Prof. Hida's solution, which is the same one I originally came up with, avoids this problem and is thus in a way less confusing than using the hint.

19A

E2. See General Comment 2.

E3. Almost no one got this right, even with the hint–it's quite hard. Here's another way to do it that a friend suggested. Imagine you have $2n$ objects, and want to choose n of them. You can do this in $\binom{2n}{n}$ ways. Or you can first divide the objects into two piles of n objects each. Now to get n objects from the original $2n$, you choose k ($0 \leq k \leq n$)from the first pile and $n - k$ from the second pile. So for each k there are $\binom{n}{k}\binom{n}{n-k} = \binom{n}{k}\binom{n}{k} = \binom{n}{k}^2$ possibilities. Summing up over all k we get the result.