Math 96:
Test Taking Strategies

December 1st, 2023

1   General Test Taking Strategies

Make sure that you are physically and mentally ready for the exam

- Get enough sleep the night before.

- Make sure to have enough to eat.

- Exercise before the test?

- Whatever else you normally do to prepare yourself for a test.

What to bring:

- Pencils/pens/erasers.

- Watch.

- Yourself.

- **Do NOT bring** scratch paper (will be provided), compass, ruler, calculator.

2   Grading

Putnam problems are graded on a 0+/10- scale. This means that very rarely will scores between 3 and 7 ever be given on a problem (though this might be changing for problems with two parts). This means that making sure that your solution is fully correct is important. On the other hand, it also means that if you can figure out the numerical answer to a problem (even without proof), it may be worth 1 or 2 points if it is not obvious.

3   Time Management

Each of the two sections of the exam will contain 6 questions and will last a total of 3 hours. The questions on each section are roughly sorted in order of difficulty and you should take advantage of this. Problems 1 and 2 are often fairly easy, and are probably where most of you should be focusing the bulk of your efforts. However, problems 3 and 4 are sometimes also easy so you should make sure to at least *look* at them. Problems 5 and 6 are usually somewhat hard, and might not be worth your time. However, it rarely hurts to look at a problem and see if you have any ideas. That said, if there is a question where you either don't understand what it is asking, or you expect that the answer depends on some more advanced math that you haven't learned yet, you may want to skip it.

Now because of the way grading works, if you solve a problem, it is probably a good idea to spend a fair bit of time to make sure that you have a well written proof of it. If you think you have a solution, making sure that it is correct and well written is probably a better use of your time than trying to solve a second one (at the very least if you are trying to optimize your final score rather than say to just have fun working on problems).

But other than that, probably my best piece of advice about time management is the following: **don't get stuck**. If you are not making progress on the problem you are working on, move on to the next one. When you come back 15 or 30 minutes later, hopefully you will have some new ideas. As long as you keep coming up with new things to try, even if they don't work, you are making progress.

4   Fun Problems

1993 B6: Let S be a set of three, not necessarily distinct, positive integers. Show that one can transform S into a set containing 0 by a finite number of applications of the following rule: Select two of the three integers, say x and y, where $x \leq y$ and replace them with $2x$ and $y - x$.

1983 A5: Prove or disprove that there exists a positive real number u such that $[u^n] - n$ is an even integer for all positive integers n.

Here $[x]$ denotes the greatest integer less than or equal to x.

1968 B6: A set of real numbers is called compact if it is closed and bounded. Show that there does not exist a sequence $\{K_n\}_{n=0}^{\infty}$ of compact sets of rational numbers such that each compact set of rational numbers is contained in at least one K_n.