

# Applying To (Applied) Math Grad School

## General questions

- How does the funding work?
  - MS programs: you typically have to pay, but can sometimes obtain funding from the department
  - PhD programs: typically your department pays your tuition and gives you a small stipend on which to live (usually in the range of \$20,000-\$30,000 per year). The funding for this can come from you acting as a TA, your advisor, or fellowships. Fellowships or advisor funding (an RA) are usually preferential since being a TA takes up a decent chunk of time.
- Who should you talk to to find out if grad school is for you, or to learn more?
  - TAs: talk to the TAs of your math/applied math classes in office hours or arrange a meeting
  - Professors: arrange a meeting or ask in office hours
  - An academic counselor
  - If you are interested in the research topic of a particular faculty member here at UW, ask them who else is doing similar research and where you should apply

## What do you absolutely have to do if you want to go to graduate school for a PhD?

- Find people to write you letters of recommendation (most places require three--more tips below)
- Take the GRE (see <https://www.ets.org/gre>)
  - General test: required by almost all schools.
    - Offered virtually daily at many different testing centers
    - The test has three sections: verbal, quantitative, and analytical writing. The quantitative section is the main one (applied) math grad schools are interested in. Unfortunately this test can only really hurt you as a high quantitative score is expected.
    - You must arrange for ETS to send your scores to the schools to which you apply.
  - Math Subject test (optional)
    - Offered three times a year (next three are 9/14/19, 10/26/19, and 4/4/20). Give yourself lots of time to study for this exam should you decide to take it.
    - Not all schools require it, but many do. A high score can improve your application.
- Upload your unofficial academic transcript on the application sites of the schools to which you apply (later in the process you may be asked to have your official academic transcript sent out)
- Write and submit some sort of statement of purpose/personal statement as part of each application (some schools request multiple essays)

## What makes for a strong applicant? What kinds of things should one be doing now if one wants to go to grad school in the future?

- Research experience
  - Apply to participate in REUs (Research Experience for Undergraduates) or similar programs
    - These programs usually take place over the Summer, are **paid**, and can allow you to get research experience, publications, and letters of recommendation
    - Look on the NSF website for programs that fit your interests and apply [https://www.nsf.gov/crssprgm/reu/reu\\_search.jsp](https://www.nsf.gov/crssprgm/reu/reu_search.jsp)
    - Look on the AMS website for programs that fit your interests and apply <http://www.ams.org/programs/students/emp-reu>
  - Work on a project with WXML: <http://wxml.math.washington.edu/>
  - Many faculty members, instructors, postdocs, or even grad students are willing to work with undergraduates on research projects. Initiate one by setting up a meeting and asking them if they are interested in working with you.
- Publications
  - If you are able to publish a paper, be sure to reference it in your application
  - There are some journals which are geared toward undergraduates:

- <https://www.siam.org/students/siuro/>
  - <https://unl.libguides.com/c.php?g=51642&p=333916>
- Get strong letters of recommendation
  - Typically you want your letters to be written by faculty members (more senior/established faculty members, if possible). They should be familiar with your work and/or research (e.g. you did well in their class and built up some sort of a relationship with them)
    - Go to office hours and tell professor you're thinking about applying to grad school. Show them that you are hardworking and intelligent by coming with insightful questions about the material. The more they get to know you, the more they'll have to say about you in their letter.
    - If you do an REU, you can ask your REU mentor to write you a letter. But be careful that you don't obtain too many of your letters this way as some admissions committees will penalize you for it
    - Sometimes letter writers will write a neutral or even negative recommendation. When you ask someone for a letter of recommendation, ask them whether they can write you a *strong* letter.
    - It is usually a bad idea to get letters from faculty members who don't know you well or instructors from classes in which you got a poor grade.
    - Ask letter writers for tips on where to apply. Once you have a tentative list of departments to which you want to apply, consider running it by one or more of your letter writers.
- Take challenging, but relevant courses and try to get good grades in them
  - If you plan to apply to an applied math program, you want to have some applied math classes under your belt. Grad school classes are tough. Doing well in challenging, advanced courses during undergrad demonstrates to departments that you will be able to handle their courses.
  - Most applied math departments will expect you to have taken courses in: numerical analysis, differential equations and/or dynamical systems, and linear algebra. Some programming experience is helpful too.
  - If you can, consider taking some graduate-level courses
  - Your grades in math/applied-math/coding classes are more important than your grades in other classes
- Write a coherent statement of purpose/personal statement
  - Applications are considered as a whole. If one area of your application is weaker than others you may wish to explain it here.
  - Demonstrate knowledge of the department by discussing faculty members whose research interests you.
- Fellowships
  - PhD students are expensive for departments to fund. Having your own source of funding (a fellowship) can make you a much more attractive candidate.
  - NSF: <https://www.nsf.gov/funding/aboutfunding.jsp>
  - DOE: <https://www.krellinst.org/csgf/>
  - NASA: <https://science.nasa.gov/learners/learner-opportunities>
  - AMS has a nice list: <http://www.ams.org/programs/students/gradinfo/gradinfo>
  - There are also many niche and/or school-specific fellowships available, e.g. Soros and AAUW
- Posters or conference presentations
  - If you do research, seek out opportunities to present it at conferences and/or poster sessions
  - E.g. <https://www.washington.edu/undergradresearch/symposium/>
- Compete in relevant competitions
  - SIAM has a few: <https://www.siam.org/publicawareness/competitions.php>
  - The Putnam exam: <https://www.maa.org/math-competitions/putnam-competition>
  - More competitions listed here: [https://en.wikipedia.org/wiki/List\\_of\\_mathematics\\_competitions#National\\_college\\_competitions](https://en.wikipedia.org/wiki/List_of_mathematics_competitions#National_college_competitions)
- Math-related extracurriculars (e.g. tutoring math or participating in a math club or math circle)
- Participate in UW's McNair program which helps prepare you for grad school: <http://depts.washington.edu/uwmcnair/>
- If you identify as a member of an underrepresented minority group, apply to be a math alliance scholar: <https://mathalliance.org/math-alliance-scholars/predoctoral-scholars/becoming-an-alliance-predoctoral-scholar/>