

## Helping Undergraduate Students into Graduate School

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We discussed several elements of a successful graduate school application.

### Mathematics Subject GRE Scores

Many graduate schools do not consider a student's mathematics subject GRE scores to be a big component of their application; in fact, several graduate schools do not require them. Most schools value other elements of an application above GRE scores, and the more information the school has about a student, the less important the student's GRE scores are. It is generally true that the more mathematics courses a student takes, the better the student will do on the mathematics subject GRE. For this reason, students should wait as long as possible to take the exam. On the other hand, it looks bad on a graduate school application when a student who has taken many mathematics courses still receives a low score. In general, it is difficult for a graduate program to weigh mathematics subject GRE scores very highly. For example, since the GRE emphasizes pure mathematics, students who are more interested in applied mathematics do not perform as well. One member of the discussion felt that American students perform worse than non-American students on the mathematics subject GRE. At least one graduate school represented in our discussion values the general GRE score, and more specifically the verbal GRE score, more highly than the mathematics subject score. For schools that do require mathematics subject GRE scores, there is a wide range of opinion about what constitutes an acceptable score, from below the 30th percentile for some schools to above the 70th percentile for others. Of course not all graduate programs were represented in our discussion, and probably the range is even larger.

There was some debate about whether an applicant should avoid sending their mathematics subject GRE scores to schools that don't require them if they determine that their scores are below par. Some members of the discussion group felt that mediocre mathematics subject GRE scores can only hurt an application, and students should not send them unless they're required. Others felt that students should not attempt to manipulate the system, and they should send them along if they have taken the exam.

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### **Recommendation Letters**

There was uniform agreement that recommendation letters are the most important part of an application to graduate school in mathematics. Students should get to know their professors well so that their professor will have a lot of positive things to say in a recommendation letter. If a student has participated in a summer research program at a different institution, getting a letter from the director of the program, or the student's advisor in the program, is essential for a strong application; if readers of an application notice that the letter is missing, they may infer that the student's performance in the program was unsatisfactory.

A recommendation letter should be no more than 2 pages long, and should talk about the student specifically. It is generally bad form for the director of a summer research program to include more than a brief description of the program and research the student has done. If a longer description is required, members of the discussion group suggest including it as an appendix to the letter, or as a link to a description on a website.

A recommender who writes many recommendation letters and rates every student very highly becomes remembered as such, and their letters are discounted. Recommendation letters should always be positive, but also provide specific and honest information about the particular student under consideration. The opinion of a faculty member who is known for writing honest letters is weighed very highly. Having said that, recommenders must be very careful not to make statements in a recommendation letter that can be construed as a negative comment about the student. For example, if a letter describes a student as "hard-working" without also specifically mentioning mathematical talent, readers of the application might infer that the student is weak. Recommenders should be careful not to accidentally discredit their students in this way.

### **Cover Letter**

The group spent some time discussing whether a student should specifically mention faculty members they wish to work with in their letter of application. We agreed that students should not list faculty members in their letter based solely on their field. A professor might not be accepting graduate students, or turn out not to be a good match for the student, or be close to retirement. At the least, the student should spend time reading the faculty member's research to make sure it's something that she's interested in. It is very useful for a student to know as much as possible about the school and the department, and helpful if they know members of the department, but students should be careful not to ask a professor to commit to advising before they have spent time at the institution and the professor has gotten to know their work.

### **Best Versus Right**

When choosing the school, it's easy for a student to think that he should attend the highest ranked school he's accepted at. However, members of the discussion group agreed that this is generally a bad idea. Students should seek out a school that fits them, a school that is "right" for them, and should resist pressure to attend the "best" school in terms of rankings. Students should talk to a large number of faculty and graduate students in the department to find out if graduate

students are happy there, and talk to them one-on-one, so that graduate students can speak honestly about their experiences. In a worst-case scenario, when the student determines that a school is a bad choice only after they begin as a graduate student, they can always transfer to a different school later on.