

# Plans for life after graduation by William Yslas Vélez

## PRELIMINARIES for graduate school

1. If your goal is to apply to graduate school then begin talking to faculty and graduate students as early as possible.
2. Take the time to speak with your teachers, giving them information about yourself so that they can use to write letters on your behalf.
3. Become involved in scientific and educational initiatives, and take a leadership role in some of them. Examples
  - a) research, including summer internships in universities and businesses
  - b) tutoring
  - c) problem solving groups
  - d) the local math club
  - e) outreach activities to the local high schools
  - f) universities oftentimes provide leadership training opportunities
  - g) participate in undergraduate mathematics conferences
  - h) create a resume

SAMPLE RESUME

## COURSEWORK

1. Students often pursue a doctoral program in an area different from their undergraduate degree.
  - a) Profiles of UA graduates
  - b) <http://math.arizona.edu/ugprogram/prospective/alumniprofiles.html>

- c) Flexibility of the mathematics major
2. In determining which courses to take (and you should take more than the minimum), you should look where you are headed to.
  3. It is common that math majors pursue graduate programs other than mathematics
    - a) Mathematical Biology: <http://www.math.ohio-state.edu/graduate/apply>
    - b) Computational Neural Biology
    - c) Financial Engineering/ Economics:  
<http://www.math.ncsu.edu/finmath/index.html>
    - d) Engineering: <http://meng.engineering.cornell.edu/>
    - e) Whatever
  4. Coursework:
    - a) The very good schools require graduate courses and research experience
    - b) The good schools in pure math would like students to have: year-long course in algebra and analysis, plus semester long courses in linear algebra and complex variables, topology would be nice
    - c) The good schools in applied math would like students to have: analysis, linear algebra, familiarity with computing software, numerical analysis, differential equations
    - d) Programs in statistics would like students to have: analysis, linear algebra, probability, statistics. Minors in economics and the biological sciences help.
    - e) Programs in mathematics education vary a great deal. Most require a degree in math and some teaching experience.
    - f) Coursework for programs of study, other than mathematics, need to be investigated
    - g) The biological sciences are a real growth area. You might consider taking the basic year-long courses in biology and chemistry

## PREPARING TO APPLY

1. In submitting documents for admission, the student should understand the impact that these documents can have. It is these documents that will sell your case.
2. Letters of recommendation are required and students should plan early for these. When asking for a letter of recommendation, it is a good idea to meet with the faculty member in person and provide a resume.
3. Decrease the workload on the faculty who write for you by providing addressed envelopes and paperwork that has been filled out.
4. Many applications are now done on-line. Be organized in presenting the information to the faculty member.
5. Whom should you ask for letters?
6. GRE: <http://www.ets.org>
  - a) General and subject test information can be obtained at the above site.
  - b) Some departments require these while others just recommend it.
  - c) Low subject GRE test scores may cause departments to wonder about your mathematical preparation.
7. Statement of purpose
  - a) Avoid rambling
  - b) Avoid grammatical and punctuation errors
  - c) If there is an anomaly in your grades, it should be explained
  - d) The statement is read very seriously and you should have others review it before sending it in.
8. Most students applying to graduate school do not know what area they want to go into. If you do, look over faculty interests and mention the work of some of the faculty in your statement.
9. Apply to VIGRE schools
10. Each time you apply to a school, it costs you money. In applying to schools you should have a safe list of schools, schools where you would very likely get in.

You don't want to be in limbo at graduation time. You need to consult with faculty on this one. This past year some of our students had difficulties in getting accepted. The economy is down and you should be aware that this decreases the amount of funds available to students.

11. If you are going to graduate in December, think about applying to spend a semester at a national lab or Budapest/Moscow.

An example: [http://www.dep.anl.gov/p\\_undergrad/](http://www.dep.anl.gov/p_undergrad/)

12. Thinking of becoming a high school mathematics teacher? There are now several programs that will pay you to earn a Master's degree and at the same time earn certification. Several states have their own programs.

<http://math.arizona.edu/ugprogram/mcenter/careerassistance.html>

13. Are you interested in teaching at the community college level? If so, then a Master's degree in the subject area is required.

## **FUNDING YOUR GRADUATE STUDIES**

1. National fellowships: NSF Graduate Fellowship Program

a) [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=6201&org=NSF](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=6201&org=NSF)

2. When you apply to a graduate school, you most likely also automatically apply for financial support.

3. In many instances, departments are more interested in funding students who will proceed to the PhD, instead of just an MS degree.

4. You should also consider professional masters degrees, though it is harder to find support for these programs.

<http://www.ams.org/tools/masters.html>

5. What to do between graduating and entering graduate school

a) opportunities are limited, most REUs do not support senior who have graduated, but some do (like the one that you are in.)

b) national labs and companies are possibilities.

c) UCLA-IPAM

<http://www.ipam.ucla.edu/>

5. Thanking your supporters after you get in

## **Applying for jobs instead of graduate school**

Much of the same advice applies to this situation. However, there is one real difference..

You should have a minor that supports your mathematical studies, and that minor should be technical. A computer science minor is very supportive in applying for jobs.

Employers would like to see some evidence that you

- a) Do more than is required of you
- b) Have good communication skills and can work as part of a group
- c) Summer internships in industry are a real plus

Contact your Career Center to see how to begin the process of meeting with recruiters. Oftentimes, Career Centers have workshops on interviewing skills (maybe even mock interviews)

Sometimes mathematics departments keep track of their graduates. Think about applying to firms that have hired math majors from your department.

Begin early, do not wait until your last semester.

Think about applying for positions in the federal government. Many require security clearances and these clearances may take as long as nine months to obtain. If you are going this route, then think about applying for internships with these government agencies.

Some places to consider in the federal government.

- a) CIA analysts: <https://www.cia.gov/careers/index.html>
- b) US Census Bureau: <http://www.census.gov/hrd/www/jobs/mathstat.html>
- c) US Dept of State: <http://www.state.gov/careers/>
- d) National Security Agency: <http://www.nsa.gov/>

## **My own experiences as an applied mathematician**

Applied mathematics, in the workplace, is oftentimes undergraduate level mathematics, but applied with a profound knowledge of the subject.

That is one reason for continuing on to earn a Master's degree, since this solidifies your knowledge of undergraduate level mathematics.