

Advanced Mathematics/Computer Science Research 11 (9674)

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Google Classroom Code: 57ggnwr

Problem solving skills and mathematics research are closely related. It is not possible to do mathematical research without spending time doing mathematics. So be prepared to do a bit of exploring this year.

Selecting a topic is not only the first step in doing research but it is also the *most* critical step. Your topic should allow you to examine material that interests you. Pay attention in class - you might be inspired by an unanswered question or an alternate solution to spark your interest. The topic that you chose should be something you truly enjoy since you will be spending a great deal of time reading, writing, and experimenting with different cases and parameters.

Your summer assignment has been designed in the hopes of sparking your interest in a topic or in giving you time before school to figure out more about your topic.

“Mathematics possesses not only truth, but also supreme beauty” Bertrand Russell. I hope you find this to be the most exhilarating, enjoyable, and rewarding course you have ever taken. I know that it can be. All it takes is your commitment to do the best that you are capable of doing.

Summer Assignments:

What is meant by a summary?

A summary means exactly that. Read the article and then write the paper in your own words. Do not quote unless necessary. Watch out for plagiarism. The articles may be found in mathematics journals, magazines, sections or chapters of mathematics texts, in newspapers, or excerpts downloaded from the internet. Include all pertinent documentation relative to the source of the article. If an internet page was the basis for your paper, print out the entire section or pages from the website and include it as an addendum to your paper. Read each article with thoughts about how you might extend the topic. Ask yourself if you would be interested in learning more about the subject matter. If the author left you with some unanswered questions would you like to do research to discover those answers? Be sure to include these remarks in your summaries.

Remember, as you read the articles, you are searching for a main area of study that will keep your interest at an optimum level for many months.

Option A Checklist- if you have already chosen a research topic.

<p>1. Start a log book on Google Docs (or use a traditional notebook, but be prepared to post PDFs not pictures of the pages) as soon as possible that documents your efforts to pick a topic and begin your research this summer. The logbook <i>will be collected on your first day of class</i> and must contain at least 25 entries.</p> <p>Each entry must:</p> <ul style="list-style-type: none">(a) Possess a date.(b) Start with a “Purpose”(c) Have a minimum of 10 sentences that details your work for the day(d) Conclude with a “My Next Step Is”	
<p>2. If you haven’t used LaTeX before, watch all 7 Episodes of YouTube tutorials that will teach you how to write a mathematical paper using the online software called “ShareLaTeX”. Your research paper must be written in this format, so get comfortable with it. Search “Beginners Latex Tutorials” on YouTube.</p>	
<p>3. An easy way to get introduced to the topic is to watch some lectures or videos. Watch 10 videos that are closely and directly related to your topic and summarize mathematical concepts that are directly related to your research. These should be kept in your logbook, but do not count as 10 separate entries. They can be included as part of an entry, though.</p>	
<p>4. Find two books on the topic and have them <i>in possession</i> either by purchasing them or borrowing them by the first day of class. They will be checked.</p>	
<p>5. Read 3 mathematical articles or journals from reputable publications, and type a one page summary on each article. These publications should be on the latest development of the topic not an introduction to the concept.</p>	
<p>6. It is helpful if you have a mentor. To begin the process of looking for a mentor, accumulate 10 names and their contact information such as their email, school address and/or even social media connections.</p>	
<p>7. Finally, create a Prezi presentation file that summarizes all the items above and be prepared and ready to present in class the first day of class. Your presentation will be graded based on content and your presentation skills.</p>	

Option B Checklist: if you have NOT already chosen a research topic.

****A topic must be chosen by September 15th****

<p>1. Start a log book as soon as possible that documents your efforts to pick a topic and begin your research this summer. The logbook <i>will be collected your first day of class</i> and must contain at least 25 entries.</p> <p>Each entry must:</p> <ul style="list-style-type: none">(a) Possess a date.(b) Start with a “Purpose”(c) Have a minimum of 10 sentences that details your work for the day(d) Conclude with a “My Next Step Is”	
<p>2. Watch all 7 Episodes of YouTube tutorials that will teach you how to write a mathematical paper using the online software called “ShareLaTeX”. Your research paper must be written in this format, so get comfortable with it. Search “Beginners Latex Tutorials” on YouTube.</p>	
<p>3. Examine the Society for Science website to see a list of past abstracts submitted. Keyword: Math, Any Category, Any Country, Any State, and click All Abstracts Matching Criteria. This will allow you to see all projects in this category since 2004. Use these abstracts as your guide. https://abstracts.societyforscience.org/</p> <p>Also, spend time on:</p> <ul style="list-style-type: none">(a) http://mathforum.org/library/toc.html(b) http://www.ams.org/programs/students/emp-student-research(c) http://mathforum.org/library/drmath/sets/high_projects.html(d) https://www.youtube.com/channel/UCoxcjq-8xIDTYp3uz647V5A(e) http://www.ncams.org/math-fair.html <p>Pick three topics that interest you and research them further - via videos, articles, and books.</p>	
<p>4. Read at least three mathematical articles or journals on your topics from #1 from reputable publications, and type a one page summary on each article.</p>	

<p>5. It is helpful if you have a mentor. Once you have a chosen topic, you will amend this list, but practice is important. To begin the process of looking for a mentor, accumulate 10 names and their contact information such as their email, school address and/or even social media connections. The people you chose should be professionals in the topics you've chosen to look into - authors of articles, professors, business owners, teachers.</p>	
<p>6. Finally, create a Prezi presentation file that summarizes all the items above and be prepared and ready to present in class the first day of class. Your presentation will be graded based on content and your presentation skills.</p>	