Bard Math CAMP 2025 Application

A Note for Parents

We welcome all interested students, encourage those who feel shy to join, and offer scholarships to make attendance possible for students at all economic levels. We value the diversity of our student body, especially with groups traditionally underrepresented in the mathematical sciences.

March 3, 2025

Dear Parent,

Thanks for helping your child apply to our Creative and Analytical Math Program. The Bard Math CAMP Interest Form is the first step towards application to our program. The next step is the Math Activity Packet for your child to complete. This packet is the formal application.

Applications received by April 30th will receive full consideration. We expect to review all applications and inform you by May 15th whether we are inviting your child to join us.

Please print out this packet for your child and have them complete it by hand. They may use additional pages, of course. When they are done, please scan and put their work together into a single, neatly organized PDF document. (There are many easily available apps that produce very readable PDF scans.) Email it to us at hello@bardmathcircle.org.

Please do not help your child solve the problems!

But do make sure that they understand the instructions, and know that we accept many students who do not answer all the questions.
Then leave the questions for your child to puzzle over. Taking a few days to ponder the problems is fine. What is more important in determining suitability for the program is whether your child enjoys trying the challenges or if they find them stressful or otherwise unpleasant.

If appropriate, you may include a note about how your child engaged with this packet, and how you interacted with them throughout the process.

Sincerely,

Japheth Wood and Frances Stern
Co-directors, Bard Math CAMP

March 3, 2025

Dear Student,

Thank you for submitting the CAMP Interest Form.
Now it's time for the Math Activity Packet, which is the formal application.
Please print this out and complete it by hand. You may use additional pages, of course.
When you are done, please scan and return it as a single, organized, PDF document.

Please solve the problems on your own! Use scratch paper and show us your thinking!

You may ask your adult for help in clarifying the instructions. It is important to know that we accept many students who do not answer all the questions.

You may use a calculator on these activities, or write a computer program if you know how. (Most CAMP students have no programming experience; that's okay.)

Take your time to puzzle over these questions. Taking a few days to ponder is fine.

If you enjoy working on these problems, especially the parts that you can't answer in less than five minutes, then you will probably enjoy attending CAMP this summer. If you don't enjoy this application, then you might find CAMP to be stressful or otherwise unpleasant.

Please consider asking your adult to write a note about how they were part of the application process for CAMP.

Sincerely,

Japheth Wood and Frances Stern
Co-directors, Bard Math CAMP

Name:

Please tell us why you want to attend the Bard Math CAMP.

(Write 2–3 sentences, or more if you like. You may describe what math you have especially enjoyed figuring out, or any information we should take into consideration.)

Instructions: Solve the following problems, writing your answers clearly. We're very interested in *how* you solved them, so please write out your steps or tell us how you know your answer is correct. Feel free to be creative, except don't search the internet or use AI. You may use a calculator and/or write a computer program. If you do, please let us know. Use additional pages as needed to write out your answers.

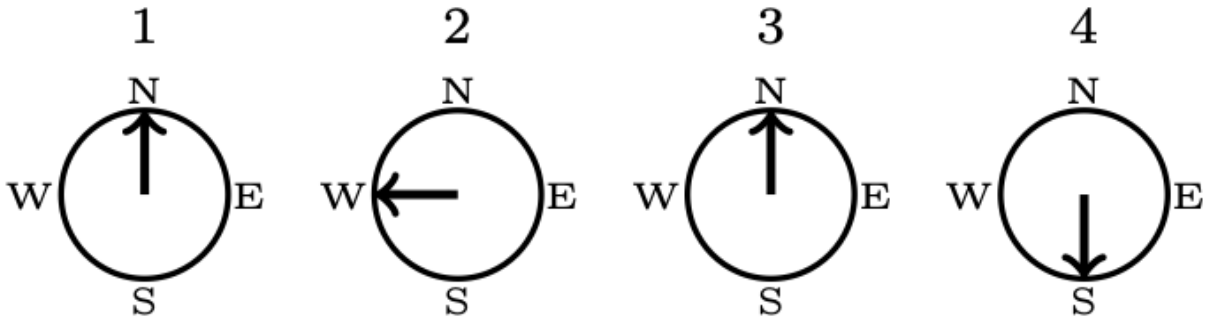
1. At an after-school math circle, snacks are provided. One day the coordinator offers 12 different snack, of 3 types: fruit, savory and cookie:

Fruits	**Savories-with-Crackers**	**Cookies**
apple	cheese	chocolate chip
banana	peanut butter	oatmeal
orange	hummus	vanilla sandwich
pear		chocolate sandwich
		ginger bread

Students may choose any 2 snacks, so long as they are not both in the same category.

How many different snack pairs can be made?

2. A video game has 4 dials in a line, each of which can be in either "north", "south", "east", or "west" position (NWNS). How many patterns of north/south/east/west can there be for the 4 dials? For example, dials 1, 2, 3, and 4 could be in positions north–west–north–south, as shown here:



3. In how many ways can 4 students, J, K, L, and M, be lined up in one line so that they are next to each other for a photo?

4. Why are the answers to questions 2 and 3 different?

In the questions below, fill in the boxes using the digits 1, 2, 3, 4, 5, 6, 7, 8, and 9. Each digit can be used at most once in each question, and one per box.

5. What is the *largest* possible value of this fraction?

$$\frac{\square}{\square}$$

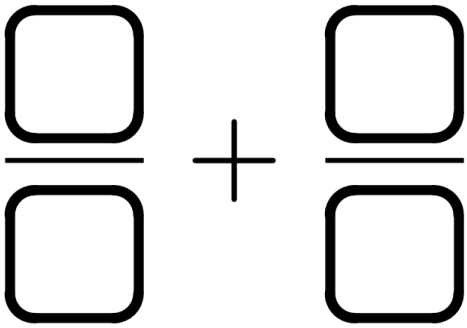
6. What is the *smallest* possible value of this fraction?

$$\frac{\square}{\square}$$

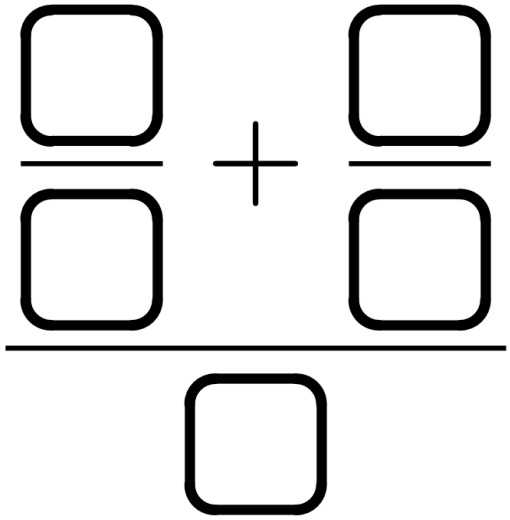
7. What is the *largest* possible sum of these two fractions?

$$\frac{\square}{\square} + \frac{\square}{\square}$$

8. What is the *smallest* possible sum of these two fractions?



9. What is the *largest* value that you can find for this complex fraction?



One of the great things about CAMP is the opportunity to write computer programs to further explore mathematics. We understand that you may not have any previous programming experience, or you might be quite accomplished!

Describe your Computer Science (CS) and Programming knowledge and background in the following questions.

If you don't have any relevant experience, no worries! Just write “N/A” and leave the rest blank. Or take a risk and fill in your best guesses. Please complete this section without checking reference material, just use what you know in your head.

1. What programming languages have you worked with?

2. Describe your favorite programming achievement.

3. Variables

- What is a variable in CS?

- How do you declare a variable in your favorite programming language?

4. Write a short function to print out “Bard CAMP 2025” in your favorite programming language.

Applications received by April 30th will receive full consideration.

When you have completed this packet,

- [ ] Please organize your pages and scan them as one PDF document. If you don't have a flatbed scanner, we recommend using a smartphone scanning app. The results can be quite good.

- [ ] Email the PDF to <hello@bardmathcircle.org>.
  Use the subject line: <Student Name> 2025 CAMP Math Activity Packet

- [ ] If things are going slowly and you won't have this completed by April 30th, send a friendly email to <hello@bardmathcircle>.