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, 2026

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 without giving hints, 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, 2026

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 all your thinking! If you have worked and find you've gone down a path that doesn't work, just put a line through it and try again. Please include those pages of work too.

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.) **If you use a calculator, let us know what you entered into it and if you write a program, include a print of it.**

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 **all** your steps, **even those that don't work**. 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.

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 if you ensure good lighting and hold the phone steady..

☐ Email the PDF to <hello@bardmathcircle.org>.
   Use the subject line: <Student Name> 2026 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>.

Fractions

If you can't solve some of these, share your partial solution or thoughts along the way.

1) Using only three of the digits 1 to 9, **and each digit only once**, what is the largest number you can create by substituting digits for the letters a, b, and c in the complex fraction below? Show your substitutions and the value of the equivalent, non-complex fraction in its most simplified form.

$$\frac{a}{\dfrac{b}{c}}$$

2) Using only four of the digits from 1 to 9, and each digit only once, what is the largest number you can create by substituting digits for a, b, c and d in the complex fraction below? Show your substitutions and the value of the fraction in its most simplified form.

$$\frac{a}{\dfrac{b}{\dfrac{c}{d}}}$$

3) At the end of the school year, there is a pile of gloves in the lost and found. Sorting through them you find that two thirds of the left gloves match three fifths of the right gloves, with each pair of gloves different from every other pair. What fraction of the gloves had matches?

4) Given: a, b, & c are all positive integers. **and not necessarily all different**, and

$$\frac{\frac{a}{b} + \frac{a}{c} + 1}{\frac{b}{a} + \frac{b}{c} + 1} = 11$$

Task: Find all such triples (a, b, c) for which a + 2b + c ≤ 40.

Show how you found your answer..

Ciphers

A **cipher** is a code that substitutes a letter or symbol for each letter of the "plaintext" message. A Caesar cipher, supposed to be how Julius Caesar sent messages to his troops, substitutes letters by using the same, fixed displacement for each of them.

For example, if the displacement is three, then the plaintext letter a is enciphered with the encoded letter D, b is replaced by E, and m by P.

5) Here is a quotation written in Caesar cipher. What is the plaintext message? The displacement is not necessarily three.

"PM AOL KLMPUPAPVU VM WYPTL UBTILYZ DLYL, 'UBTILYZ

AOHA OHCL LEHJASF ADV MHJAVYZ: VUL HUK PAZLSM',

PA DVBSK PUJSBKL ULNHAPCL VUL HZ H WYPTL UBTILY!"

 ---N. D. (a fourth-grade student)

6) What word or words could be added to the quote above to correct the error it highlights?

7) Here is another cipher to decode, also written in Caesar cipher. What is the plaintext message?

"CQJXUCQJYSI YI DEJ QREKJ DKCRUHI, UGKQJYEDI

SECFKJQJYEDI, EH QBWEHYJXCI: YJ YI QREKJ

KDTUHIJQDTYDW."

---William Paul Thurston
in "Mathematicians: An Outer View of the Inner World" (Mariana Cook and Robert Clifford Gunning, Princeton University Press, 2009).

Computer languages

8) Please describe your CS and Programming knowledge and background in the questions below. What programming languages have you worked with?

9) Describe your favorite programming achievement.

Feel free to respond N/A to the following questions if you are not sure, or if they do not apply:

10) What is a variable in CS?

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

12) Write a short function to print out "Bard CAMP 2026" in your favorite programming language.