

Math Academy Application 2022

How to Apply

1. Complete the following sections:

Part 1: About You

Part 2: Algebraic Fluency

Part 3: Challenge Problem

2. Follow these directions:*

- Do each section on its own piece of paper. If you use more than one piece of paper for one section, staple it.
- Type the About You section.
- Paper clip the three sections together, but do not staple the sections together.
- Write your ID number at the top of each section.
- Do not write your name on any page.

* It is important to follow these directions because they make your application anonymous and easy to process, and also because the ability to follow written directions is an indicator that you are able to handle the self-directed learning that takes place in Math Academy.

3. Turn in the application no later than noon on Friday, May 6.

If you are not an SVMS student

Send an email to ewyner@scottsvalleyusd.org by Thursday, April 28. Give your name, your school's name, and your math teacher's name and email address.

Come to SVHS at 3:30 on Tuesday, May 2, for a test on math fundamentals.

Hand in your application to the SVHS office no later than noon on May 6. Do not send your application online.

Part 1: About You

Most high school students, of any grade, would find Math Academy to be too rigorous and overwhelming, but for many students who take it, it is the most enjoyable class, despite (or because of) the challenge. The following questions will help give you, your family, and your teachers some insight into how well Math Academy might fit your learning style and interests. Please type your answers using complete sentences, and proofread your answers.

1. Most Math Academy applicants would easily get an A in Math 1 or Math 2, but not necessarily in Math Academy. What were your grades like over the past couple years, and how would you feel if you failed a math test or did not get an A in the class?
2. How do you feel about fractions and about basic algebra?
3. In most classes, work done at home serves to review what was done in class. In Math Academy, students are more self-directed, and some material is learned at home, such as through homework problems based on concepts not directly covered in class. How do you feel about using resources (textbook, notes, friends, online sources, etc.) to work on problems different than what you have experienced in class?
4. Most math classes involve learning ways to do specific things, but Math Academy is also about learning general concepts and then applying them in new situations. How would you feel about test questions that are based on reasoning about concepts learned in class rather than being similar to actual examples seen before?

Part 2: Algebraic Fluency

Most students have trouble with fractions, exponents, algebraic manipulation, and other fundamentals of arithmetic and algebra throughout high school, but students in Math Academy are assumed to be fluent with these and other topics. Most students also tend to have difficulty writing formally using mathematics, which is something expected in Math Academy.

1. Solve the equation $2 + 8x = \frac{5}{6}(5x - \frac{1}{8})$ without a calculator.
2. Erase anything you wrote in #1 that is not part of an equation.
3. Using mathematical terminology, explain your process in solving the equation. Use complete sentences.

Part 3: Challenge Problem

Your little brother has three stuffed animals: a hippo, a tiger, and bear. Every morning he lines them up in front of his room. There are six different orders he can do: HTB, HBT, THB, TBH, BHT, BTH.

The Problems

1. For his birthday he gets another tiger. He starts with them in the order THBT, but there are 11 other possible orders. List all 12 orders.
2. Your uncle gives him a third tiger. How many possible orders are there now?
3. He buys another bear, so now he has a hippo, three tigers, and two bears. How many possible orders are there now?
4. After his next birthday, he ends up with a total of two hippos, three tigers, eight bears, and a cow. How many possible orders are there now?

The Task

Your job is to explain your reasoning as you solve the problems. You do not need to explain methods you tried that turned out not to be helpful, but you are welcome to include these if you feel it will help explain why the correct methods work. Typed and handwritten responses are both fine.

The Criteria

We are looking for four things:

1. Does it seem like you actually understand the concepts you are explaining, as opposed to blindly following formulas or doing what someone told you to do?
2. Are your explanations clear enough that a student who is not doing this project could read them and understand them well enough to do problems like these on their own? (You are welcome to try this if you find a child or adult willing to be your student.)
3. Are you comfortable using appropriate mathematical terminology and notation?
4. Does it seem like you enjoyed the challenge?

There are many different ways to do these problems, and there is no expectation that you will correctly answer every question.

The Rules

You are encouraged to use resources, such as other people or online sources, with three restrictions:

1. Do not look at another student's work.
2. If someone helps you, they may not write anything.
3. Cite any source of help, whether it is an online source, a textbook, a person, etc.