

Final Reflection on the AwesomeMath Algebra 1.5 Program 2026

Why AwesomeMath?

I wanted to gain a deeper understanding of math beyond the Common Core curriculum. Most problems involve following a clear method where you apply the appropriate formula and solve for the answer. While this is important, I was looking for something different. That is when I found Olympiad-style problems from the IMO, AIME, etc. and discovered that they required experimentation and creativity rather than a simple “plug-and-chug” approach. I liked having questions with no obvious first step because each failed attempt gave me a better idea of what to try next. This is what drew me to AwesomeMath.

Online Lectures

Although I had seen Vieta's formulas before, AwesomeMath showed me how much time they can save when used right. Suppose p and q are the roots of $x^2 - 7x + 10 = 0$. Vieta's tells us that $p + q = 7$ and $pq = 10$. This specifically is useful because a problem may not ask for the roots themselves and may instead ask for something like $p^2 + q^2$. Rather than factoring the equation and finding both roots, I can use $p^2 + q^2 = (p + q)^2 - 2pq$ and immediately get $7^2 - 2(10) = 29$. Even though this is an easy example, and saving a few seconds may not seem important on one question, they add up across an entire competition and leave more time for harder problems later on. Furthermore, Vieta's formulas become even more useful when the roots are difficult to calculate directly.

Another topic that I found interesting was induction because it provides a way to prove that a statement is true for every positive integer. The process has two main steps. First, you verify that the statement is true for the initial value, usually $n = 1$. Next, you assume the statement is true for some positive integer k , called the induction hypothesis, and then use that assumption to prove it is also true for $k + 1$. If both steps are successful, the statement must hold for all positive integers. For example, consider the identity $1 + 2 + \dots + n = n(n + 1)/2$. The base case is $n = 1$, where both sides equal 1. Then assume that $1 + 2 + \dots + k = k(k + 1)/2$ is true. Adding $k + 1$ to both sides gives $1 + 2 + \dots + k + (k + 1) = \frac{k(k+1)}{2} + (k + 1)$. Factoring out $(k + 1)$ gives $(k + 1)(\frac{k}{2} + 1) = \frac{(k+1)(k+2)}{2}$, which is exactly the desired formula with k replaced by $k + 1$. I was fascinated by induction because, it is amazing that, although it is impossible to check every positive integer one by one, this method still discovers a technique that can prove that the initial statement is true for all of them.

Additionally, one area that I found useful was inequalities, particularly the Arithmetic Mean-Geometric Mean (AM-GM) Inequality and the Power Mean Inequality. The AM-GM Inequality says that the arithmetic mean of positive numbers is always greater than or equal to their

geometric mean, $\frac{a+b}{2} \geq \sqrt{ab}$, with equality if and only if $a = b$. One common application is finding the minimum value of an expression. For example, suppose $ab = 16$, and we want to find the smallest possible value of $a + b$. Applying AM-GM gives $\frac{a+b}{2} \geq \sqrt{ab} = 4$, so $a + b \geq 8$, meaning that the minimum is 8. Instead of trying many different values of a and b whose product is 16, AM-GM immediately gives both the minimum value and the condition under which it occurs, $a = b = 4$.

Testing

I earned a 70% on the first test and a 93% on the second test. The improvement showed me that I should never ignore a topic that I do not fully understand and assume that it will not matter later. In math, ideas often build on one another, so ignoring a topic can cause problems later. A future problem may rely on the same concept, and overlooking it can lead to a gap in understanding. I found that it was very important to look back at past assignments and tests after the teaching assistant returned them. The comments and hints showed me exactly where my derivation went wrong and gave me a chance to correct the problem. Reviewing those mistakes helped me avoid making the same errors on later problems.

Experience

Despite being an online course that I completed entirely at home, I still learned many lessons throughout the program. Since AwesomeMath encompasses an entire course into just two weeks, the pace is incredibly fast. Missing even a single class can make the next lesson much harder to follow, so I learned that even though attendance was not required, consistently showing up was the best way to keep up. Time management was also a key skill. Rather than waiting until the afternoon, I completed the homework the morning after each lecture while the material was still fresh in my mind, making it much easier to remember ideas. Another lesson I learned was to not be afraid to contribute during class. There were many times when I did not have a complete solution, but I still shared the progress I had made with the instructor. Even when my approach was completely incorrect, the instructors could give me a hint and help me understand where I went wrong.

Final Takeaways

This course improved my algebra skills by reviewing concepts I had not used in a while while also introducing new topics. I am extremely grateful to the Garwin Family Foundation for giving me the opportunity to participate in this program; I truly could not have done it without their support.

All in all, my biggest takeaway from AwesomeMath was learning to be comfortable with not reaching perfection immediately. Many of the problems could not be solved in one clean attempt, so I had to begin with an incomplete idea and improve it step by step. An unsuccessful attempt was not wasted effort because it usually showed me what did not work and gave me a better direction for the next try. The most important thing is simply to try. As Norman Vincent Peale said, "Shoot for the moon. Even if you miss, you'll land among the stars."