CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)	Project Number
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Project Title

Mathematical Origami

Abstract

Objectives/Goals

My objective was to determine how origami can be used to solve for the roots of a cubic polynomial. The goal was to discover an easier method of solving for polynomials.

Methods/Materials

The materials consisted of graph paper, a ruler, and a pencil. I utilized a method created by Austrian engineer, Eduard Lill, that involved drawing the polynomial on graph paper, making a fold using two points on the graph, and finally, using trigonometry to solve for the roots of the polynomial.

Results

The accuracy rate of solving for the roots of a cubic polynomial was the highest among polynomials that had solutions with multiplicity. Polynomials with real, rational solutions were the seconds highest while polynomials with imaginary solutions had the lowest accuracy rates. Throughout all of the data collected, the average accuracy rate was above 90%.

Conclusions/Discussion

The process of solving for the roots of a cubic polynomial with origami is indeed possible. Origami may not be able to solve for imaginary solutions but it can be solve for both rational and irrational solutions. This means that there is an alternate way of solving for the roots of a polynomials without using the Rational Zeroes Theorem.

Summary Statement

I measured the accuracy rate of solving cubic polynomials using origami.

Help Received

One of the math teachers at my school provided guidance and assistane when I was organizing my project.