CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

Jimin Kim

Project Number

J1414

Project Title

A Combinatorial Proof for the Geometric Series, Binomial Theorem, and the Square of a Polynomial with Tiling

Abstract

Objectives/Goals

Provide a visual proof for complex mathematical identities.

Methods/Materials

Paper and pencil.

Results

The three formulas I proved using a visual method called tiling helped me understand the combinatorial concept behind these mathematical identities.

Conclusions/Discussion

I proved the formulas for the geometric series, binomial theorem, and the square of a polynomial with an inductive and combinatorial approach. To do so, I used a method called tiling. This allows many visual learners to understand proofs more easily.

Summary Statement

I visually proved the formula for the geometric series, binomial theorem, and square of a polynomial using a method called tiling.

Help Received

After I had done quite some research on tiling, I stumbled upon a concept within tiling, so I reached out to the UCI Math Department and received help from a PhD, Hayan Nam.