CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)

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Project Number

S1312

Project Title

The Magic of Math: Phi, Pi, and the Fibonacci Sequence

Abstract

Objectives/Goals
My science fair relates to mathematics. It deals with the terms of phi, pi, and the Fibonacci Sequence, all of which have very interesting properties. These values appear everywhere: in nature, space, the Bible, even in flowers. I plan to show people that math does have an effect on our lives. My goal is to instill inspiration in others for math, and to set out a challenge to solve the mysteries of these terms. I want to show others that math isn't just a bunch of numbers, and everything has meaning.

Methods/Materials
For this project I needed a TI 83 graphing calculator, pencil, rough workbook, and the internet. There are three main aspects I covered on each of these terms. I derived them, showed how each is related to the other, and showed how the terms are in real life.

Results
I found that phi can be derived using limits, trigonometry, and geometric constructions, while pi can be derived using the Monte Carlo Pi Method, the Pythagorean Theorem, and the Gregory-Leibniz Series. The Fibonacci Sequence can be determined by creating a formula and using Pascal's Triangle. Pi is related to phi in the golden circle, a circle with radius phi, and through trigonometry. Pi is related to the Fibonacci Series through Euler's formula. The Fibonacci Series relates to phi through a function involving term number and f(n). Now for the main importance of the project: these terms all appear in real life and nature. Pi is used in the cosmological constant, general relativity, and Heinsberg's uncertainty principle. Phi is used to predict changes in the stock market and is involved in the orbits of some of our own planets. Almost every flower has a Fibonacci number of petals, and the human body has 2 hands, 1 face, 2 eyes, and 5 knuckles per hand, all Fibonacci numbers.

Conclusions/Discussion
Now my point is here: why? With my project I want to motivate myself and others to action on math. I believe there lays a deeper and greater meaning to these relationships. Something great will come out of analysis.
I have given you a brief overview of my project. If it is analyzed in depth, it can be very interesting and bring up many unusual things about math. I hope to give you a comprehensive look at math and its applications to the real world, which is very important. We do use math in our lives, and with my project, I hope to give people a sense of motivation.

Summary Statement

My project focuses on three unusual mathematical terms and shows people through mathematics that math is important, with a goal to inspire others to investigate mathematics and show how math is related to real life.

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