CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
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Project Number
S1409

Project Title
An Exploration of Bases: Predicting Palindromic Patterns

Abstract

Objectives/Goals
My goal was to investigate the patterns of one's digits of perfect squares in different bases. Upon finding that the pattern was palindromic, I sought to explain the reason for that pattern and a means of calculating the particular pattern for any base.

Results
I proved that the patterns of one's digits of perfect squares are palindromes in any base, found a general formula for calculating the pattern in any base, and confirmed that the formula works in base 25. Along the way I also found that the patterns in bases that are divisible by four contain double palindromes.

Summary Statement
I show why, in any base, the one's digits of perfect squares form a palindrome, and I find a general way of calculating its pattern.

Help Received
I designed, carried out, and wrote up this project myself. My advisor and my father made suggestions for editing and presenting it.