Name(s)

Naomi K. Berhane

Project Title

The Mysteries of Ancient Mathematics

Abstract

Objectives/Goals

The purpose of this project was to analyze an Ancient Ethiopian method of multiplying and relate it to binary arithmetic. This method skillfully avoids using fractions and the multiplication table which was ideal for the uneducated merchants that frequently used it with coffee beans. When multiplying two numbers, for example 25 and 31, the method divides 25 by two, while ignoring any remainders of one, until it reaches one. This is done in one column while in the second column, 31 is doubled as many times as 25 is divided by two. In any row that has an even number in the left column, the entire row is discarded. Then the entire column with the divisions of 25 is discarded. By adding the remaining groups of numbers, the correct product is given. My hypothesis is that the Ancient Ethiopian Method of multiplication is equivalent to the modern method used by computers based on the binary system.

Methods/Materials

This connection was made by first understanding how binary math works then relating it to steps of decimal multiplication and the Ancient Ethiopian Method of multiplication.

Results

The hypothesis was proved by discovering that dividing and doubling the numbers was converting a number to binary, and making the other number recognize that binary factor.

Conclusions/Discussion

The fact that this complex binary system, which is used in modern day computers, was used over 2,000 years ago shows how advanced some early civilizations were. I concluded that the method is quite general in the way that similar charts for decimal math and other bases such as base7 multiplication can be created

Summary Statement

Analyzing an ancient method of multiplication and explaining why it works.

Help Received

My father reviewed gramatical errors on my report.