441 AND ONE WAYS OF PROVING THE PYTHAGOREAN THEOREM

Research Study

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March 2002

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A Research Study
Presented to the Faculty of the
Laboratory School, College of Education
Cavite State University
Indang, Cavite

In Partial Fulfillment
of the Requirements for Graduation

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March 2002

ABSTRACT

DILOY, NOEMI G., LEZARDA, LYNNE CHERIE P., PEÑALBA, JERILEE T., SITAO, CHARLIE G., Applied Research III, Secondary Education Laboratory School, Cavite State University, Indang, Cavite, March 2002. **"441 and One Ways of Proving the Pythagorean Theorem".**

This study entitled "441 and One Ways of Proving the Pythagorean Theorem" had the purposes of collecting as many existing proofs of the theorem as possible, classifying the collected proofs as to the different types that were identified by the researchers, and constructing the researchers' own proof of the theorem.

In the conduct of the study, the researchers followed the foregoing procedure: (1) gathering of data which included the conduct of researches in the CvSU library and visitation of other libraries in Manila; (2) collating and classification of proofs; (3) statistical analysis, consisting of frequency count and determination of percentages; and (4) construction of the researchers' own proof of the theorem as inspired by the many proofs they have collected.

Four hundred and forty-one proofs were gathered by the researchers, which were classified as Algebraic, Geometric, Quaternionic and Dynamic proofs.

The statistical analysis showed that among the collected existing proofs, 27.21% or 120 were Algebraic proofs, 71.43% or 315 were Geometric proofs, 0.91% or 4 were Quaternionic proofs, and 0.45% or 2 were Dynamic proofs.

The authors constructed another proof of the theorem. The proof was derived from Heron's formula for finding the area of a triangle.

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A research study presented to the faculty of the Secondary Education Laboratory School, College of Education of the Cavite State University, Indang, Cavite, in partial fulfillment of the requirements for graduation. Prepared under the advisorship of Dr. Lorna L. Penales and Prof. Dulce L. Ramos.

INTRODUCTION

One of geometry's theorems that have been known since ancient civilization, particularly to the Egyptians and Greeks, was given so much attention not only by the mathematicians but also by others who came across this statement. This theorem has been playing a great role in geometry and it still fascinates millions of people all over the world today. As to how many proofs of the theorem exist, others say that there are only few proofs; others claim 370 proofs and others say that there are an infinite number of proofs (Landicho, 2000). Because of its different uses, not only in the field of Mathematics but also in the life of mankind, it is considered as the most elegant theorem of geometry and an extremely powerful one. The first proof of this theorem is attributed to Pythagoras that is why it is named after him, the "Pythagorean Theorem". The aforementioned claim about the infinite number of proofs interested the researchers to study the Pythagorean theorem.

Statement of the Problem

The Theorem of Pythagoras is considered as the most elegant theorem because of its different uses not only in the field of Mathematics but also in the life of mankind.