An Outlook on Polynomials

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ABSTRACT

This study explores the complexity and relevance of teaching polynomials in mathematics education. By conducting a literature review and a small informal survey among students across various grades, the research examines their experiences and challenges in understanding polynomials. The findings highlight that many students perceive polynomials as one of the more difficult topics in mathematics. Furthermore, the practical applications of polynomials appear to be limited to specialized fields such as engineering, raising questions about their broader utility for most students. The study concludes that while polynomials have specific applications, their complexity may outweigh their benefits for general use in mathematics education, suggesting a need to reevaluate their emphasis in the curriculum.

Keywords: *Polynomials, Mathematics, Complexity, Education, Coefficients, Variables, Modeling, Usefulness, Engineering*

INTRODUCTION

Ever wondered how things would have turned out if a certain math concept had not been formulated? If allowed to travel back in time and change the course of mathematics, I would choose to hamper the discovery of polynomials.

At the very beginning of my writing process for this paper, I promptly realized, with my limited education received during my eighth-grade year, how complicated mathematics could be. To build upon that knowledge, I asked other students in higher grades what area had proved to be the most difficult for them so far. Much to my surprise, a majority answered polynomials. That inspired my investigation, and throughout the length of my research, I found not only are polynomials challenging but also that they might not be that useful.

What is a Polynomial?

The question may be, "What is a polynomial?" By definition, a polynomial is a mathematical expression that comprises terms: a coefficient, which is considered any number, and a variable. In algebra, these two items are multiplied together; however, in most cases, multiplication is not written out, but rather written side by side. For instance, in expressions y^1 or x^2, the coefficient and variable are combined.

Polynomials are used to form polynomial equations, which can model a wide range of problems—everything from simple word problems to complex scientific applications. In addition, they are used to define polynomial functions.

BRIEF HISTORY

The question therefore is, who invented polynomials? Amazingly, there is no single invention of these concepts, but rather, their existence can be traced back to the Babylonians, who used what's called the sexagesimal numeral system, which up to this date influences our understanding of numbers.

Though a bit cumbersome, the sexagesimal number system is a little more confusing, according to many, than Roman numerals.

The Case Against Polynomials

I believe that polynomials have very limited usefulness compared to other math concepts. For one, the practical uses of polynomials are not that widespread; they are mainly applicable in fields like engineering and architecture, which extensively require complex mathematics. Therefore, one has to question whether it is really necessary to teach polynomials to students at school when most people will never need to use them in their professional lives. To most, their study of polynomials seems rather useless and should be treated as an optional course. The lack of polynomials would indeed leave a gaping hole in the field of algebra. However, I still think that polynomials are not useful. Some would argue that the abolishment of polynomials would further impede the progress of workers who have based their work on this field of mathematics. However, numerous research papers prove that alternative mathematical techniques—such as nonlinear regression, nonparametric statistics, and semiparametric modeling—are strikingly similar to polynomials. Such alternative systems can effectively compensate for the absence of polynomials.

CONCLUSION

polynomials can be used in specific manners, but for the most part, they convolute mathematics more than anything. Writing this article has really taught me about the history, purposes, and uses of polynomials in developing my claim. I believe the world of mathematics would survive just fine without polynomials and instead focus on other theories that are more useful and applicable to the needs of students and professionals alike.

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