

1096-VP-1508

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The Use of the Order of Operations in Reading, Writing and Solving Linear

Equations. Preliminary report.

Abstract. In arithmetic, students are taught to use the order of operations to simplify expressions. However in most beginning algebra textbooks T.O.O.O. is not mentioned in the content of algebra. This research aims to answer two questions: 1. Should students continue to use the order of operations in algebra? 2. How to best incorporate the order of operations in math teaching beyond arithmetic? We have found that TOOO is crucial for students to learn linear equations well. First, it provides students with a tool to "read" equations besides solving them by rules. From the process of reading, they understand that an equation can look short and simple, but in fact is complex and requires skills to decode. For example, the equation $4x-5=12$ is a sentence of seven math words: 4,x,*,-,5,=,12, among them the multiplication is invisible and therefore often neglected. Secondly, the ability of reading equations enables students to write equations for word problems. In this talk, we will discuss how to use the order of operations in reading, writing and solving linear equations. We will also discuss how TOOO provides students with an effective way of dealing with parentheses in solving certain equations, such as $2(4x-5)+3=12-2(4x-5)$, and $3333(8x/7-5)=9999$, besides using distributive law. (Received September 17, 2013)