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## Expanded Grammer for Detecting Equivalence in Math Expressions

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**Abstract:** Structured information (e.g. mathematical information) is one type of Web information. Text-based search engines fall short in retrieving such those information. For example, when a user search for  $x(y+z)$  using Google, Google retrieves documents that have  $xyz$ ,  $x+y=z$ ,  $(x+y+z)=xyz$  or any other document that contains  $x$ ,  $y$ , and/or  $z$  but not  $x(y+z)$ . Google ignores the structure of the expression  $x(y+z)$ . The structure of certain math expression conveys the correct interpretation of that expression. Text-based search engines have achieved a good level of maturity in refining text search. Unfortunately those search engines did not achieve the same progress in terms of mathematical contents as a separate distinguished type of text. The major obstacle to math search in current text search systems is that those systems do not differentiate between a user query that contains a mathematical expression and any other query that contains text term. Therefore, they process mathematical expressions as other texts, regardless of its nature of being well-structured and having properties that make it different from other forms of text. Here, in this context we benefit from the concept of digital ecosystems to refine the text search process to be applicable in searching for a mathematical expression by implementing a system that is responsible for detecting equivalent math expressions. Actually, we will add more algorithms to the Information Retrieval System in order to make it suitable to do search for a mathematical expression as well as other forms of text.