

ZMATH 2015d.00735

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Spreadsheets: laying a foundation for understanding functions.

Spreadsheets Educ. 8, No. 2, 36 p., electronic only (2015).

Summary: Linear, quadratic, and exponential functions, as well as polynomial functions, are the most basic mathematical expressions. Despite being among the most basic expressions in algebra, these functions are often used to approximate more complicated functions. The Common Core State Standards for Mathematics provide the framework for a discussion of the basic functions presented here. To that extent, the content of this paper consists of the use of spreadsheet technology in experimentation with linear transformations in the plane; experimentation with the way quadratic functions behave; constructing and comparing linear, quadratic, and exponential models of real-life data; and automation of the computation of real zeros of polynomials where such calculations require implementation of time consuming iterative procedures. An iterative procedure based on the rational zeros theorem will be used to find exact values of rational zeros of a polynomial. A second iterative procedure based on the bounds on zeros theorem and the intermediate value theorem will be used to approximate all real zeros of a polynomial.

Classification: I20 U70 N50

Keywords: teaching; spreadsheets; worksheets; functions; student activities; polynomial functions; zeros; approximation; iteration; transformations in the plane; simultaneous linear equations; exploratory learning; graphical representations; visualization; linear functions; quadratic functions; exponential functions; real-life mathematics; weather; temperature; mathematical model building

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