

**ZMATH 2015e.00921**

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**Interpolation and polynomial curve fitting.**

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Summary: Two points determine a line. Three noncollinear points determine a quadratic function. Four points that do not lie on a lower-degree polynomial curve determine a cubic function. In general,  $n + 1$  points uniquely determine a polynomial of degree  $n$ , presuming that they do not fall onto a polynomial of lower degree. The process of finding such a polynomial is called interpolation, and the two most important approaches used are Newton's and Lagrange's interpolating formulas. Each has its advantages and disadvantages, as we will discuss. In this article, we show how both approaches can be introduced and developed at the precalculus level in the context of fitting polynomials to data. These methods bring some of the most powerful and useful tools of numerical analysis to the attention of students who are still at the introductory level while building on and reinforcing many fundamental ideas in algebra and precalculus mathematics. (ERIC)

*Classification:* N50 K80

*Keywords:* interpolation; curve fitting; polynomials; Newton interpolation; Lagrange interpolation; polynomial regression

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