

Getting tight error bounds in floating-point
arithmetic: illustration with complex functions,
and the real x^n function

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Abstract

The specifications provided by the IEEE 754 standard for floating-point arithmetic allows one to design very simple algorithms for functions such as x^n , or complex multiplication and division, that are much more accurate than what one might think at first glance. We will show how tight error bounds are obtained for these algorithms, and discuss how generic examples can be built to show the tightness of these error bounds.