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Paul R Bouthellier* (pbouthe@pitt.edu), 504 East Main Street, Titusville, PA 16354. *How Calculators Calculate: The Good, The Bad, The Truly Ugly-A Hands-On Tour.*

Bring your calculators and let the fun begin. In this talk we shall consider two related topics: First are examples of where the results from our calculators are either flat-out wrong or at least appear to be wrong. These errors come from limited internal accuracy, limited digits on the display, and problematic internal mathematical algorithms (for root-finding, derivatives, integrals, etc. . .). Often, such errors are a great way to start discussions about concepts in calculus and numerical analysis courses. Secondly we shall show some algorithms which calculators can use to efficiently calculate functions such as $\sin(x)$, $\cos(x)$, $\tan(x)$, $\ln(x)$, and exponential functions. These algorithms will show how beautiful and practical mathematical algorithms can be used in devices which students use every day. (Received August 15, 2013)