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A Geometric Definition of the Derivative.

In first-year calculus, students are taught that the derivative, where it exists, is the slope of the tangent line at a point on the graph of a function, and possibly that the derivative is the optimal linear approximation at that point. However there is, among other viewpoints, a very geometric approach to derivatives using tangent cones. In this talk, we shall use detailed and colorful graphics to provide a very visual way of defining the derivative of a function that also carries over readily to multivariable functions. In addition to providing a more intuitive entry point to the derivative for students of first-year calculus, the tangent-cone approach also provides advanced students a pathway into the field of geometric measure theory. (Received September 22, 2017)