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Andrew Gillette, Tyler Kloefkorn and Victoria Sanders*,
victoriasanders@email.arizona.edu. *Using Sage to Create Lists of Shape Functions for Trimmed Serendipity and Serendipity Finite Elements*. Preliminary report.

The finite element method is a numerical method used to approximate solutions to partial differential equations. These methods work by dividing the computational domain into smaller, more manageable pieces, and associating a space of piecewise-defined functions. There are a number of finite element methods, and some are more efficient for computation than others. A specific finite element features a list of shape functions (or polynomial functions attached to differential forms). In this project, we build lists of the shape functions for the trimmed serendipity and (non-trimmed) serendipity families of finite elements. Along the way, we introduce code in Sage to evaluate the Koszul operator and generate lists of shape functions. (Received September 25, 2017)