We present SetPad, a new application prototype that lets computer science students explore discrete math problems by sketching set expressions using pen-based input. Students can manipulate the expressions interactively with the tool via pen or multi-touch interface. Likewise, discrete mathematics instructors can use SetPad to display and work through set problems via a projector to better demonstrate the solutions to the students. We discuss the implementation and feature set of the application, as well as results from both an informal perceived usefulness evaluation for students taking a computer science foundation exam in addition to a formal user study measuring the effectiveness of the tool when solving set proof problems. The results indicate that SetPad was well received, allows for efficient solutions to proof problems, and has the potential to have a positive impact when used as both an instructional tool and as an individual student application.