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A practice-based theory of mathematics knowledge for teaching

Teachers face problems and use mathematics in ways that are distinctively different from other mathematically-intensive professions such as engineering, physics, economics, or nursing. The problems that teachers have to solve demand flexible use of fundamental mathematical ideas, and fluency with mathematical representation, language, and reasoning. We argue that careful analysis of actual teaching practice can offer insights into the mathematical demands of teaching. Such insights can usefully ground improvements in the design of mathematics learning opportunities for both preservice and experienced teachers. This session will engage participants in firsthand experience with some of the mathematical problems that arise in teaching, and will also offer possible directions for new designs for teacher education.