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Complexities in students' construction of the polar coordinate system.

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Summary: Despite the importance of the polar coordinate system (PCS) to students' study of mathematics and science, there is a limited body of research that explores students' ways of thinking about the PCS. Research on students' construction of the PCS is especially sparse. In this article, we highlight several issues that arose spontaneously during a teaching experiment that explored students' construction of the PCS. We illustrate how students' angle measure meanings influenced their construction of the PCS. We also discuss how the students' ways of thinking about the Cartesian coordinate system (CCS) became problematic as they transitioned to the PCS. Collectively, we highlight that students' ways of thinking about coordinate systems evolve when students reason within and across multiple coordinate systems.

Classification: G79 C39

Keywords: polar coordinates; coordinate systems; pre-service secondary teachers; teaching experiment; quantitative reasoning

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