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Fostering connections between the verbal, algebraic, and geometric representations of basic planar curves for student's success in the study of mathematics.

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Summary: We discuss the significance of making connections between the verbal, algebraic, and geometric representations of basic mathematical objects for students' understanding of mathematical instructions. Our survey of 499 students enrolled in a pre-calculus university course reveals that such connections are not always present, even if the objects themselves are familiar to the students. We stress that the ability of making these connections needs to be specifically addressed in teaching mathematics at various levels. A proper attention to the matter contributes to the formation of students' mathematical background, which makes a difference for their success in study of calculus, in particular.

Classification: I24 I25 C34 C35 E44 E45 C74 C75

Keywords: line; circle; semicircle; parabola; hyperbola; ellipse; planar curve; graphical image; prototype; algebraic formula; algebraic transformation; mathematical definitions; modes of representation; concept formation