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Grant, Melva R.; Crombie, William; Enderson, Mary; Cobb, Nell

Polynomial calculus: rethinking the role of calculus in high schools.

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Summary: Access to advanced study in mathematics, in general, and to calculus, in particular, depends in part on the conceptual architecture of these knowledge domains. In this paper, we outline an alternative conceptual architecture for elementary calculus. Our general strategy is to separate basic concepts from the particular advanced techniques used in their definition and exposition. We develop the beginning concepts of differential and integral calculus using only concepts and skills found in secondary algebra and geometry. It is our underlining objective to strengthen students' knowledge of these topics in an effort to prepare them for advanced mathematics study. The purpose of this reconstruction is not to alter the teaching of limit-based calculus but rather to affect students' learning and understanding of mathematics in general by introducing key concepts during secondary mathematics courses. This approach holds the promise of strengthening more students' understanding of limit-based calculus and enhancing their potential for success in post-secondary mathematics.

Classification: D30 I10
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