

ZMATH 2016a.00257

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They'll need it for calculus.

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From the text: Imagine a self-propelled lawn mower that is tied to a stake by a rope. As the lawn mower runs, the rope wraps around the stake, pulling the mower closer with each revolution. My Calculus 2 students viewed a video of this scenario one recent semester. The lawn mower is already under way as the video begins, and the viewer sees only a few revolutions before the video ends. We worked to answer this question: How long will it take to complete the mowing? As my students undertook the challenge of answering this question, I came to understand that they were struggling to write an equation to describe the lawn mower's path. This surprised me, and it forced me to reflect on what it means to be ready for calculus. This article focuses on the big question of what it means to be ready for calculus; it also explores the role of the middle school curriculum in preparing students to study calculus later. This should not be construed as an endorsement of the pipeline to calculus or as an assignment of responsibility for these ideas to the middle school curriculum and to teachers exclusively. Instead, this article is written for an audience of middle school teachers from the perspective of a former middle school teacher and current college teacher.

Classification: D23 I23

Keywords: goals of mathematics education; learning objectives; lower secondary; curriculum; content selection; linear equations; polar coordinates; spirals; elementary algebra; calculus; previous knowledge; functions; slope; rate of change; graph of a function; nonlinear relationships; quadratic relationship; exponential relationship; finite differences; student activities

http://www.nctm.org/Publications/mathematics-teaching-in-middle-school/2014/Vol20/Issue5/They_II-Need-It-for-Calculus/