

Break-Ground:

Let's run to class

Two young mathematicians race to math class.

Check out this dialogue between two calculus students (based on a true story):

Devyn: Riley, I want to go to math class. Now. Let's race!

Riley: Yes. I love math class. Let's do race! On, your mark. . . . Ready. Steady. Go!

Devyn: You may think you're fast, but I'm catching up!

Riley: Noooooo!

Devyn: Now I'm winning! I've never won a foot race in my life!

Riley: Never. . . give. . . up!

Devyn: Whew! We both made it to math class at exactly the same time!

Riley: Wow. We should run to every class. Hey I have a question, was there a time during our race that we were running at exactly the same speed?

Problem 1 Which of the following describes the race above?

Multiple Choice:

- (a) Devyn was leading until the end, when the race finished in a tie.
- (b) Riley was leading until the end, when the race finished in a tie.
- (c) Devyn was leading, then Riley was leading until the end, when the race finished in a tie.
- (d) Riley was leading, then Devyn was leading until the end, when the race finished in a tie. ✓
- (e) None of the above.

Problem 2 What can you say about Devyn's and Riley's average velocities?

Learning outcomes: Use the Mean Value Theorem to solve word problems. Compare and contrast the Intermediate Value Theorem, the Mean Value Theorem, and Rolle's Theorem.

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Multiple Choice:

- (a) *Devyn has the larger average velocity.*
- (b) *Riley has the larger average velocity.*
- (c) *Their average velocities are equal. ✓*
- (d) *None of the above.*

Feedback (attempt): *Since Devyn and Riley start and stop at the same time and place, their average velocities are equal.*

Problem 3 *Record your guess to Riley's question: is there a moment during the race where Devyn and Riley were running at exactly the same speed?*

Free Response: *Enter your guess of "yes" or "no", then come back after the Dig-In to see if your guess was correct!*
