# Teaching Award Winners at MAA MathFest

## Lara Pudwell, Valparaiso University: In Math, New Is Relative

Though the Alder Award recognizes her excellence in teaching, Lara Pudwell (Valparaiso University) devoted part of her Alder Award address at MAA Math-Fest 2014 to a story about an experience she had as a student.

As an 11th-grader at White Station High School in Memphis, Tennessee, Pudwell entered her precalculus class one day expecting a paper-and-pencil quiz asking her to match the equations of 15 functions—quadratic, absolute value, exponential, inverse sine, and so on—to their graphs. Instead, she got a graph taped to her back and instructions to identify it by circulating the room and asking her classmates yes-or-no questions.

"I thought, 'I can do this quickly,'" Pudwell recalled. "'I know my math. I will ask questions that divide [the set of possibilities] about in half every time, and I'll be done in three or four questions.'"

But no. Pudwell's inquiries about her graph's asymptotes, intercepts, and extrema quickly ruled out all the functions on the list she'd studied.

When the time came for each student to name his or her graph, Pudwell—who had entered the classroom that day with a 108 percent average—could only confess perplexity.

At her teacher's prompting, Pudwell recounted everything she'd found out about her graph.

"Would you like to guess what graph was on my back?" Pudwell asked her MathFest audience. "What 11th-grader is going to say Dirichlet's function?"

Dirichlet's function, Pudwell explained, is the indicator function for the rational numbers, defined on the real line to be 1 for all rational numbers and 0 for all irrationals. Dirichlet's function is continuous nowhere.

It had never occurred to the teenage Pudwell that such a thing was even possible. In her Alder Award address, Pudwell said that she remembers her first exposure to Dirichlet's function as if it were yesterday.

Looking back as an instructor herself, Pudwell is impressed at how her precalculus teacher, Nancy Gates, crafted an activity that not only met different students at different levels but transformed what could easily have been a dry topic into something extraordinary. Gates introduced Pudwell that day to the joy of discovery.

"Was it discovery in the same way as research?" Pudwell asked listeners in Portland. "No, because it wasn't new mathematics, but it was discovery of mathematics that was new to me. And I think that, in certain classes, that's just as important if not more important."



Pudwell

### The Henry L. Alder Award

In January 2003 the MAA established the Henry L. Alder Award for Distinguished Teaching by a Beginning College or University Mathematics Faculty Member to honor beginning college or university faculty whose teaching has been extraordinarily successful and whose effectiveness in teaching undergraduate mathematics is shown to have influence beyond the faculty member's own classrooms. An awardee must have taught full time in a mathematical science in the United States or Canada for at least two, but not more than seven, years since receiving a doctoral degree. See a list of past winners at *maa.org/awards/alder.html*. For this year's award citations, see *http://bit.ly/1r8STpi*.