

Euler path in the graph is the same as the dotted-line path on page 2.

(5) Have students share other successful paths. Then review the terminology (*graph*, *vertex*, *edge*), if needed. Introduce *vertex of odd degree* and *vertex of even degree*. Elicit that this graph contains only two vertices of odd degree and that every successful path for this problem began at one of these vertices of odd degree and ended at the other.

Define *Euler Path* in reference to this activity; e.g., "What you have created here is known as an Euler path. Mathematicians define an Euler path as a path that includes every edge of the graph exactly once." Pose the question, "Can you have an Euler path with more than two vertices of odd degree?" Students, of course, will need to explore with other graphs to answer this question. Summarize the activity and answer questions from students.

According to the level, knowledge, and experience of your students, drawing the map on a large tarp and constructing the graph using tape and large dots (small paper plates work well as vertices) is an effective way to carry out this activity. Having learners actually walk along the edges to show their paths is important. As an edge is traveled, place a marker of some kind on that edge, so that when the path is finished, everyone can easily observe that each edge has been traveled exactly once.

Many other books could serve as the springboard for a similar activity. Among appropriate titles are the following:

- Ahlberg, Alan and Janet. *The Jolly Postman*. New York: Wilteinemann Little, 1987.
- Burton, Virginia Lee. *Katy And The Big Snow*. Boston: Houghton Mifflin, 1943.
- Dubois, William. *The Twenty-One Balloons*. New York: Puffin Books, 1989.
- Fitzhugh, Louise. *Harriett the Spy*. New York: Dell, 1964.
- Juster, Norman. *The Phantom Tollbooth*. New York: Knopf, 1961.
- Lewis, C.S. *The Lion, the Witch and the Wardrobe*. New York: MacMillan, 1950.
- Lobel, Arnold. *Frog and Toad Are Friends*. New York: Harper Trophy, 1979.
- Lowry, Lois. *Number the Stars*. New York: Dell, 1989.
- Taylor, Mildred. *Roll of Thunder, Hear My Cry*. New York: Penguin Books, 1976.

The Discrete Reviewer

Janice C. Kowalczyk

Above-Average Discrete Math Titles

This column highlights four (somewhat) recently published books for discrete math educators and "wannabees". The books I have chosen range from serious to the very playful. In this sample of four, there should be at least one match for anyone has an interest in discrete mathematics

Discrete Mathematics in the Schools

Joseph G. Rosenstein, Deborah S. Franzblau and Fred S. Roberts, eds.

American Mathematical Society & National Council of Teachers of Mathematics, 1997

ISBN: 0821804480

Cost : \$30

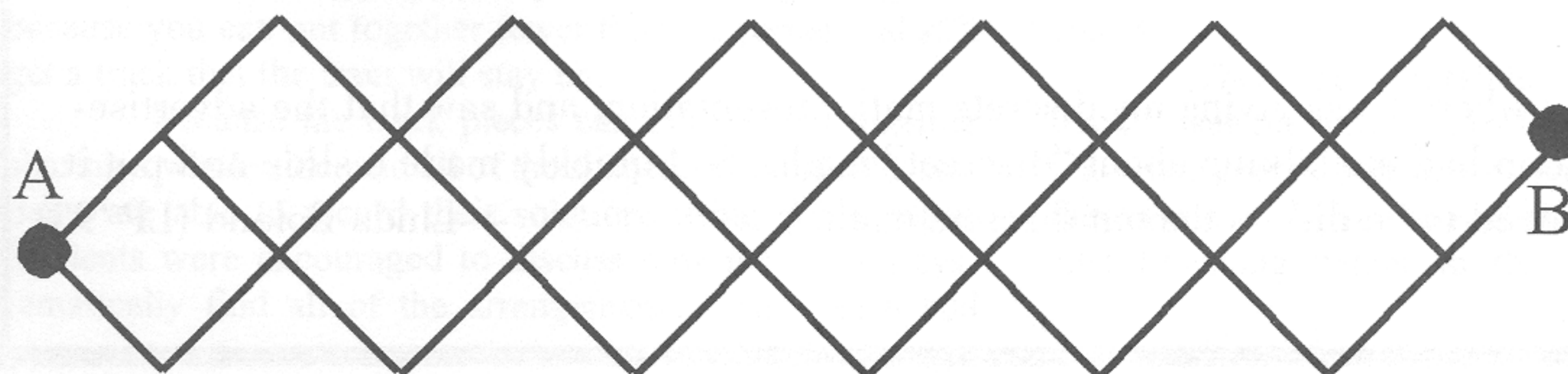
Grades: Anyone with an interest in mathematics education and mathematics reform

From the preface: "Discrete mathematics can and should be taught in the K-12 classrooms. This volume, a collection of articles by experienced educators, explains why and how, including evidence for "why" and practical guidelines for "how." It also discusses how discrete mathematics can be used as a vehicle for achieving the broader goals of the major effort now underway to improve mathematics education.

"This volume is intended for several different audiences. Teachers at all grade levels will find here a great deal of valuable material that will help them introduce discrete mathematics in their classrooms, as well as examples of innovative teaching techniques. School and district curriculum leaders will find articles that address their questions of whether and how discrete mathematics can be introduced into their curricula."

The complete preface, an introduction entitled *Discrete Mathematics in the Schools: An Opportunity to Revitalize School Mathematics*, a description of the organization of this volume and an annotated summary of the articles can be found at the Website:

<http://dimacs.rutgers.edu/Volumes/Vol36.html>



Interesting Answer

How many paths are there from A to B in the graph to the left, moving only in an eastward direction?