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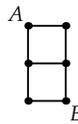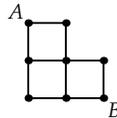*Activity Sheet for the March, 2010, MATHCOUNTS Mini*
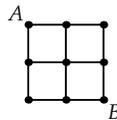
Warm-Up!

Try these problems before watching the lesson.

1. If a ladybug walks on the segments of the diagram from point A to point B moving only to the right or downward, how many distinct paths are possible?

2. If a ladybug walks on the segments of the diagram from point A to point B moving only to the right or downward, how many distinct paths are possible?

3. If a ladybug walks on the segments of the diagram from point A to point B moving only to the right or downward, how many distinct paths are possible?

The Problem
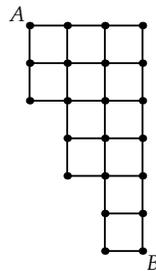
If a ladybug walks on the segments of the diagram from point A to point B moving only to the right or downward, how many distinct paths are possible?

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Follow-up Problems

4. If an ant walks on the segments of the diagram from point A to point B moving only to the right or upward, how many distinct paths are possible?

5. A 16-step path is to go from $(-4, -4)$ to $(4, 4)$ with each step increasing either the x-coordinate or the y-coordinate by 1. How many such paths stay outside or on the boundary of the square $-2 \leq x \leq 2$, $-2 \leq y \leq 2$ at each step? (*Source: AMC 12*)

Further Exploration

6. How many different 9-letter "words" can we form by arranging the letters in RRRRRRUUU?

7. How many 9-step paths are there from A to B in the grid below?

8. If your answers to the two previous problems are not the same, do the two problems again. If they are the same, then explain why these two problems are essentially the same.

9. Become a fan of MATHCOUNTS and a fan of Art of Problem Solving on Facebook. (These are two separate pages on Facebook; please become a fan of both!) You'll receive important announcements about MATHCOUNTS and about other programs for students of math, science, and engineering.

Wow! Share Your Thoughts

Have some thoughts about the video? Want to discuss the problems on the Activity Sheet? Visit the MATHCOUNTS Facebook page or the Art of Problem Solving Online Community (www.artofproblemsolving.com).