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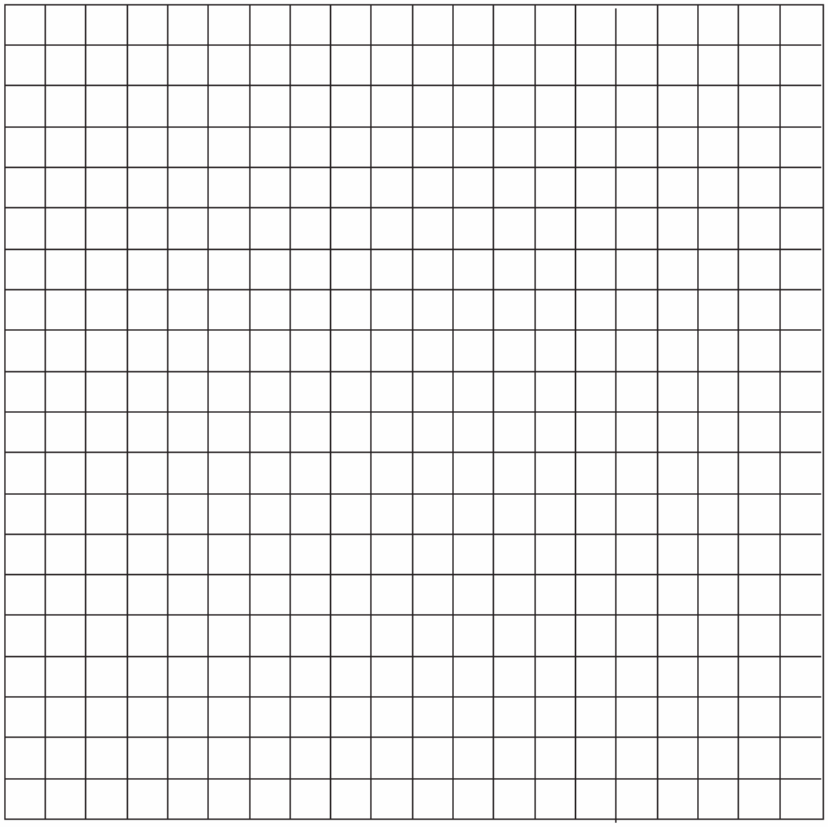
Looking for Some Direction

On state exams students are sometimes asked to solve story problems to find the (straight line) distance between two locations. I have found that by using TI-Navigator's Activity Center, students have improved their ability to visualize and then solve this type of problem. One example of such a problem from the June 2006 New York State Regents Mathematics A Examination is shown below:

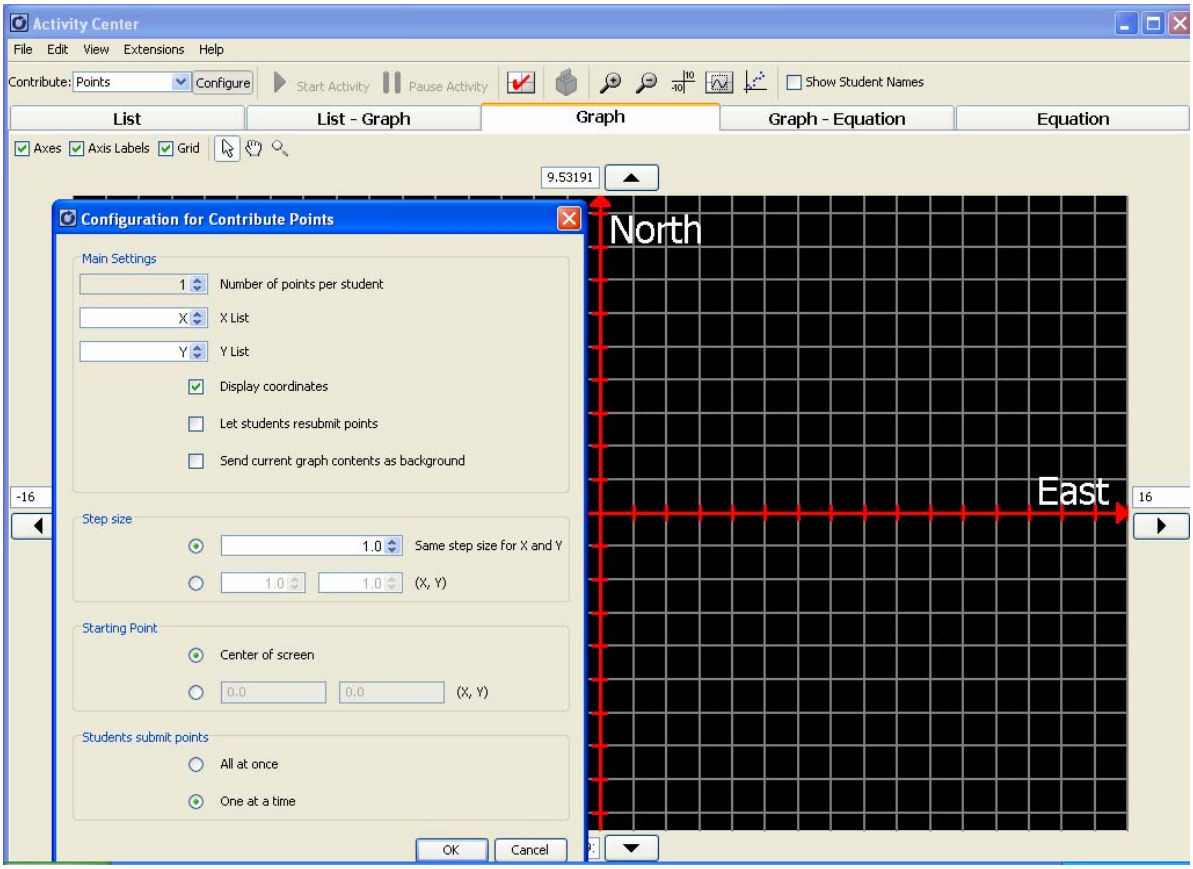
> Two hikers started at the same location. One traveled 2 miles east and then 1 mile north. The other traveled 1 mile west and then 3 miles south. At the end of their hikes, how many miles apart are the two hikers? [The use of the accompanying grid is optional.]



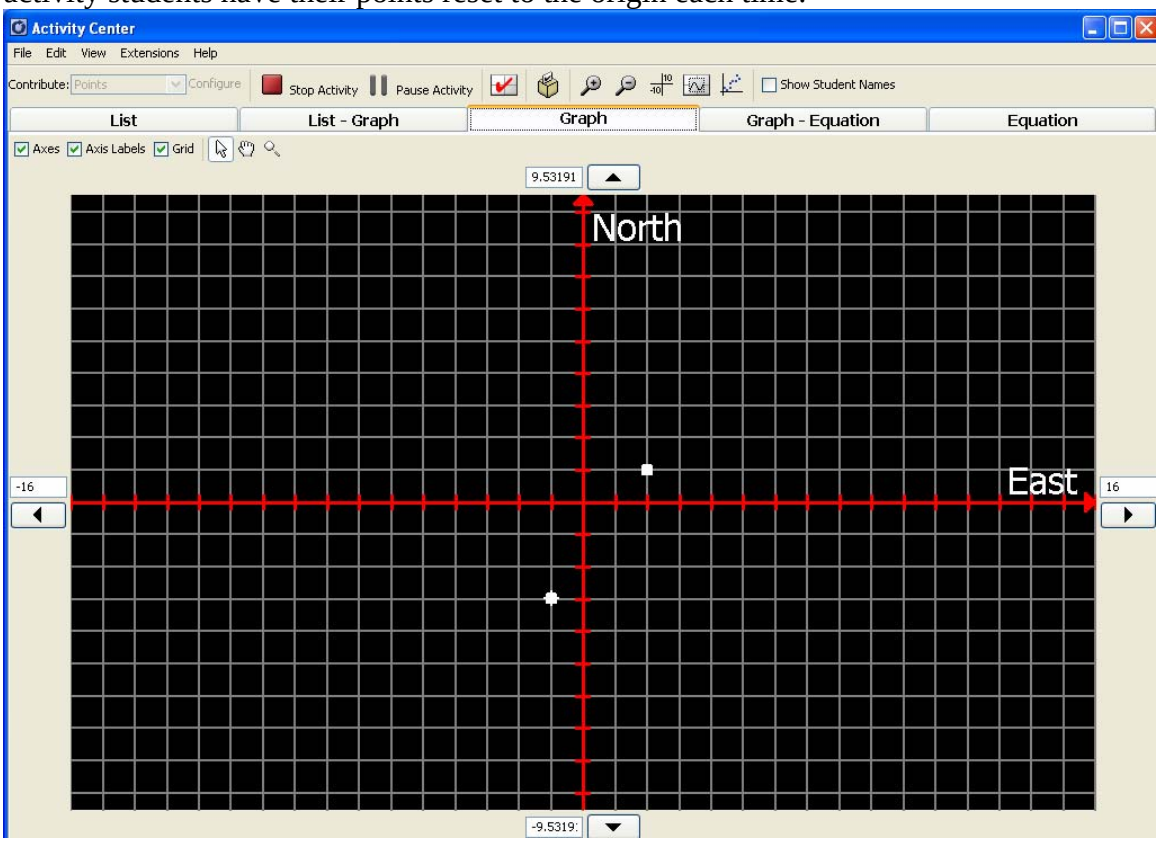
In solving this and similar problems, students come across many obstacles. First, students need to know their directions (north, south, east, and west). They then must be able to translate the location of each hiker into coordinates. I have found that students have a difficult time visualizing this problem.

If given two coordinate pairs and asked to find the distance between the two points, students could either use the distance formula or plot the points on a plane and use the Pythagorean theorem. I find that many of my students have a difficult time even getting to that point. The question doesn't tell them where to start, which many find troubling, even though it really doesn't matter where they start as long as both hikers start at the same point.

I configured Activity Center to show a coordinate plane. I allowed students to contribute points, having all students start at the origin, and then having both x and y values increase by 1.



The saved Activity Setting is included. Once I started the activity, students followed the directions of the first hiker 2 miles east and 1 mile north then submitted a point. After students had submitted their first point, I stopped the activity to check and see if everyone was in the correct spot. We could discuss that the location of the point could be translated into coordinates (2,1). I would then start the activity again without clearing the activity data and have students follow the directions of the second hiker 1 mile west and 3 miles south of the origin to contribute a second point. By starting and stopping the activity students have their points reset to the origin each time.



Once both points are plotted on the coordinate plane, students can use one of several different techniques to find the distance between the two points. This activity allows students to actually see and control the movement of the hikers and allows students to think of the origin as a natural starting place for both hikers. Some creativity could be added to this activity by inserting a background image into activity center of a satellite picture or map. I have found that students have performed better on this type of question after practicing the questions using Activity Center on the TI-Navigator.