Technology Utilization in Teaching Algebra

For this entry, I selected the "Cosmic Emergency" activity. The primary reason I selected this item was that, as a student, this is an activity that I really enjoyed. Because of this, I thought it would also be of interest to my potential students.

This piece reflects what I have learned about problem-based learning and open-ended assessment items. The activity has multiple solutions available, which I have learned is necessary to be considered an open-ended assessment item. Solutions for this activity can be found using direct algebraic techniques, as well as through the use of technology. A printout from *Geometer's Sketchpad* has been included to demonstrate one possible solution. A page with the paper-and-pencil algebra solution has also been provided. This reflects the concepts we have learned about multiple intelligences and multiple learning styles, which tell us that not all students learn in the same ways, and therefore mathematical concepts should be presented in multiple ways. Also, this reflects what I've learned about assessment, which is that students should be given various opportunities to demonstrate what they have learned.

This activity can be solved through at least three different methods: direct algebraic formulas, *GSP*, and graphic calculator. With suitable manipulatives, a manipulatives-based solution should also be possible. This reinforces my view that technology can be used as a powerful teaching tool, especially to help students *visualize* the mathematics taking place. It also serves to further convince me that manipulatives can be a useful teaching tool, even for concepts being taught at the high school level. This reversed my initial opinion that manipulatives were only suitable for elementary school students.

The activity also taught me a valuable lesson about the use of technology in mathematics education. While using *GSP* to find a solution for this activity, it was

discovered that *GSP* would give different results based on the scale of the grid. The following printouts from *GSP* illustrate this phenomenon, showing that different values were computed for the coordinates of the intersecting point and the distance from that point to the circle. Actually, there were two lessons learned here. First, it's a good idea to perform *GSP* activities ahead of time, so that settings that lead to the desired result can be determined and communicated to the students. Second, when using technology, we still have to know the foundation and theory behind what we are doing, otherwise we will never know when the technology is giving us an incorrect answer.