**Problem of the Week**

Geometry seems to be a hit of late, so here are two more geometry problems for you to try. Both came from a problem swap I had with Blair Madore when he visited recently. (Swapping problems is the mathematicians version of soldiers swapping war stories.) Enjoy!

57. Consider a set of four distinct points in the plane. For each of the six pairs of points from the set, there is a distance between them. Call the set $k$-distanced if there are exactly $k$ distinct distances. For example, a long, skinny rectangle is 3-distanced because each distance occurs twice.

Find as many 2-distanced sets as you can. Can you prove there are no others?

The next problem is really a conjecture. So it might be false. A few of us thought about it for a little while, but then moved on to other problems.

58. At Antonio’s Pizza π’s they cut pizzas using and automated pizza slicer that works as follows: The slicer has four straight blades that meet in a common point and extend from that point in both directions. The angle between adjacent blades is 45 degrees. The pizza is slid under the slicer and chopped into 8 slices.

Antonio’s pizzas are always perfect circles (of course), and if the pizza is centered under the slicer, the result is 8 slices of equal area. But what if the intersection of the blades is not at the center of the pizza?

**Conjecture:** The 8 slices can always be partitioned into two sets so that the total area of each set is the same. That is, two people can share the pizza equally without subdividing the slices.