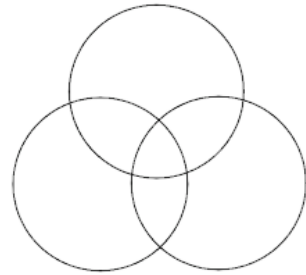


Slicing and Dicing, Lines and Planes

- 1) What is the fewest number of lines you can put on the plane to get exactly 100 points of intersection?
- 2) Draw 7 lines in the plane so that you produce as many triangles as possible.
- 3) What is the maximum number of pieces you can cut a watermelon into using 4 straight cuts, if you aren't allowed to rearrange pieces between cuts? What about 5 cuts?
- 4) How many pieces can you cut a pizza into using 5 straight cuts, without rearranging pieces? N cuts?

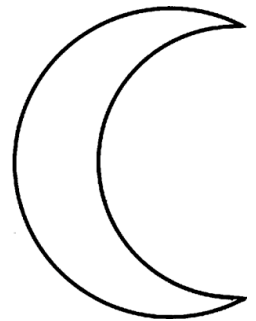
5) You can make Venn diagrams using circles that cut the plane into two regions with one circle, four regions with two circles, and eight regions with three circles. Is it possible to make sixteen regions with four circles? Generalize: how many regions can be made with n circles?



6) When you cut the plane with n "zig-zags" (two antiparallel rays joined by a line segment), how many regions can you divide the plane into?



7) How many pieces, maximum, can you cut a crescent into with five straight cuts? Does the crescent form make an advantage?



7) How many regions can you divide hyperspace into using 4 hyperplanes? Five hyperplanes? N hyperplanes?