



Problem of the Week

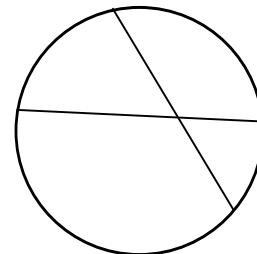
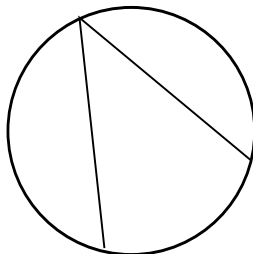
Problem B

This Strikes a Chord

A line segment that has its endpoints on a circle is called a *chord*. The diameter of a circle is a special chord which passes through the centre of the circle.

Two chords can divide a circle in two different ways:

1. non-intersecting chords divide the circle into three pieces, or
2. the two chords can also intersect, giving four pieces.



NOTE: An intersection only refers to chords crossing **inside** the circle, and for this problem, no more than two chords can intersect at one point.

- a) Three chords offer more possibilities. What is the maximum number of pieces into which a circle can be divided by three chords?
- b) Sketch all the ways a circle can be subdivided by three chords. How is the number of intersections related to the number of pieces?
- c) Find all the ways a circle can be subdivided by four chords. Is the number of intersections related to the number of pieces in the same way as in part b)?
- d) If you used six chords, what would you predict to be the maximum number of pieces? Explain your reasoning.

