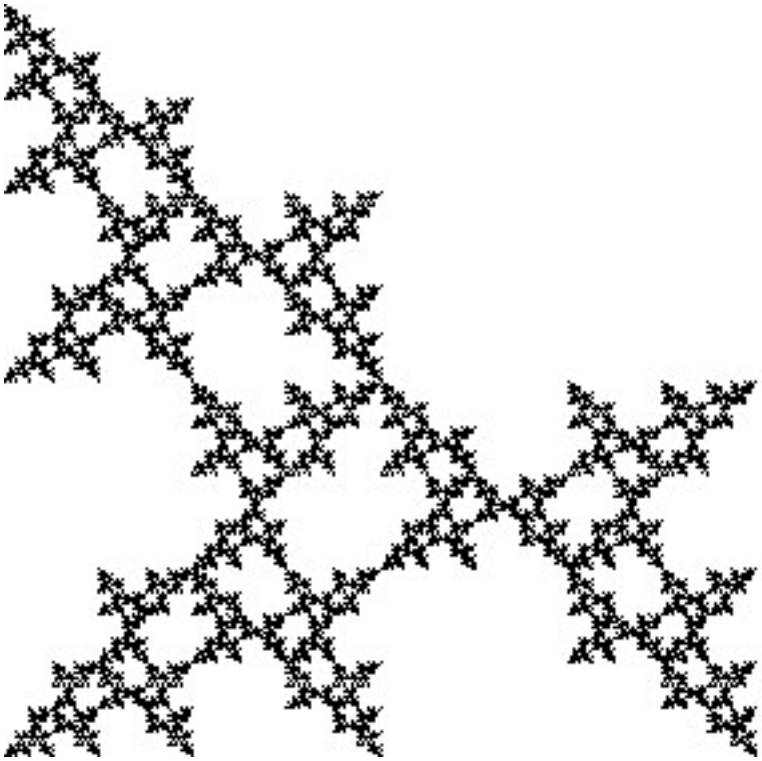
# Math 331, Fall 2002: Problems 21-24

**21.** (*expires 11/22*) [No Maple] Compute the box counting dimension of the fractal in the figure below:



**22.** (*expires 11/22*) Suppose that a turtle is moving with constant velocity 1 unit/sec. The turtle is told, every second, to steer right by an amount equal to $t^2$ degrees, where $t$ is the time (in secs). (For example, after the first step, it turns right 1 degree, then after the second, turn right by 4 degrees, and so on.) Draw the curve the turtle describes after 10 and after 100 seconds.

**23.** (*expires 11/22*) Consider the recursively defined sequence

$$S_n = S_{n-1}^2 - 4S_{n-1} + 6$$

for $n \geq 1$, with $S_0 = 5$. Implement this in `Maple` using both a recursive and a non-recursive procedure. [*Hint for the computation of the non-recursive formula: complete the square.*]
Bonus: rewrite the recursive procedure adding `option remember` and see the difference in terms of computational speed.

**24.** (*expires 11/22*) By using only `TurtleCmd`, draw a random walk of $n$ steps. (In a random walk the turtle takes a step forward, backwards, to the right, to the left, with equal probabilities, and then repeats the process.) [*Check* `rand`.]