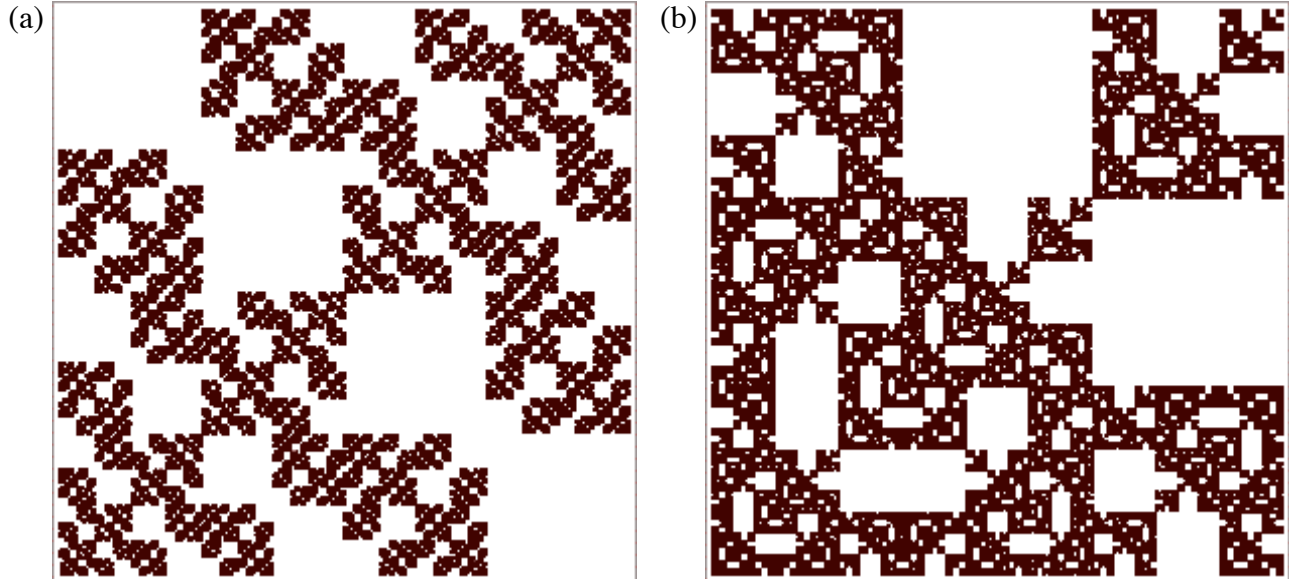# Practice Exam 5

1. Find IFS rules to generate these fractals.

(a)   (b)

2. Find the similarity dimensions of the fractals (a) and (b) of problem 1. If the Moran equation is used, solve it exactly using the quadratic formula.

3. (a) Pictured below are two IFS with memory images. Determine if either can be generated by forbidden pairs. Explain how you arrived at our answer. Give explicit details. For reference, the length three address squares are shown on both images.

(a)   (b)
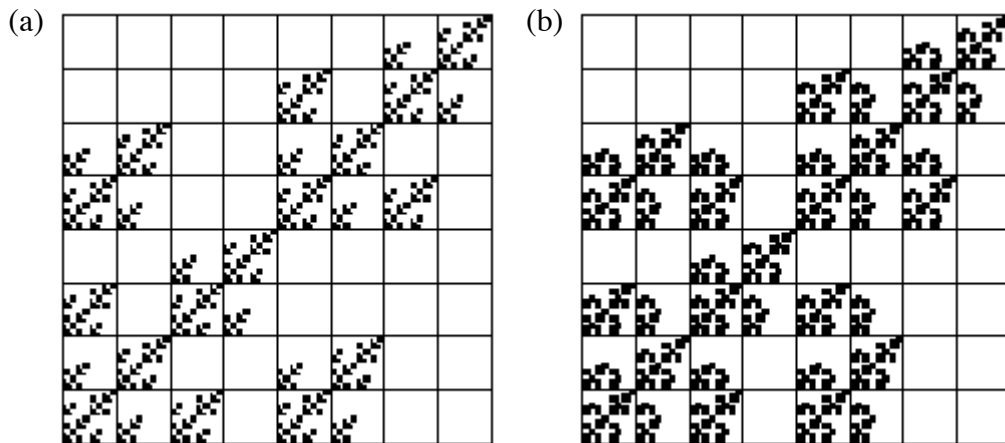
(b) For each image that is generated by forbidden pairs, fill in the appropriate arrows on the corresponding graph.

(a) ③   ④   (b) ③   ④

①   ②   ①   ②
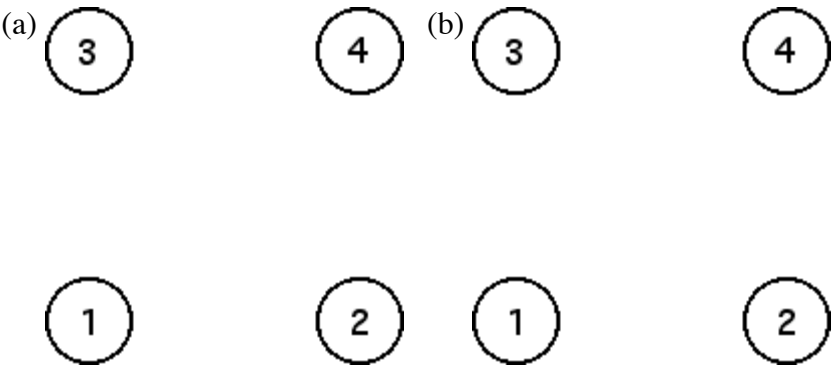
4. Pictured below are two driven IFS images. Using the bin boundaries beside each, sketch a time series that could generate the driven IFS. Explain what features of the driven IFS guided your construction of the time series.
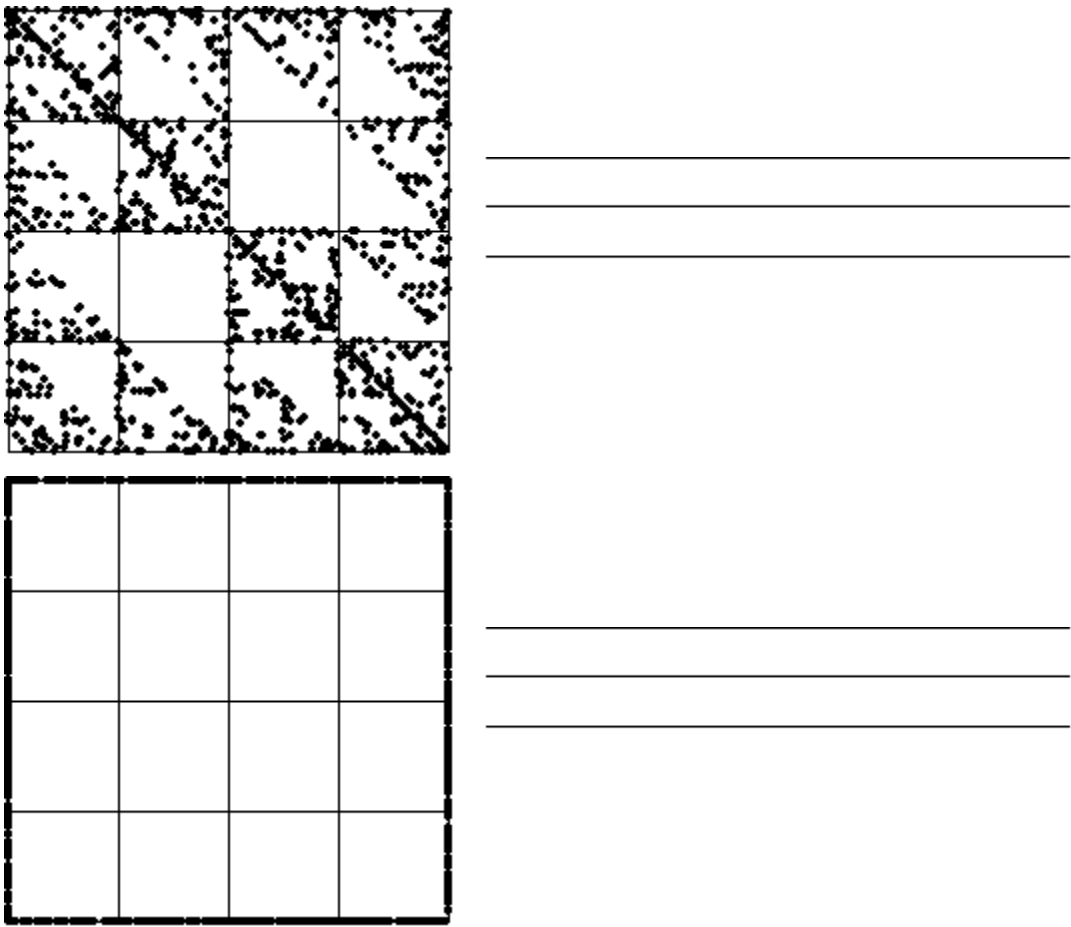
5. Pictured below is a fractal G, a relative of the gasket.

(a) What is the dimension of G? Justify your answer.

(b) What is the typical dimension of the intersection of G with a line segment L? Assume both L and G lie in the plane. Justify your answer.

(c) Draw a line segment L for which L ∩ G has dimension log(2)/log(3). Explain why your placement of the line segment gives this dimension for L ∩ G.
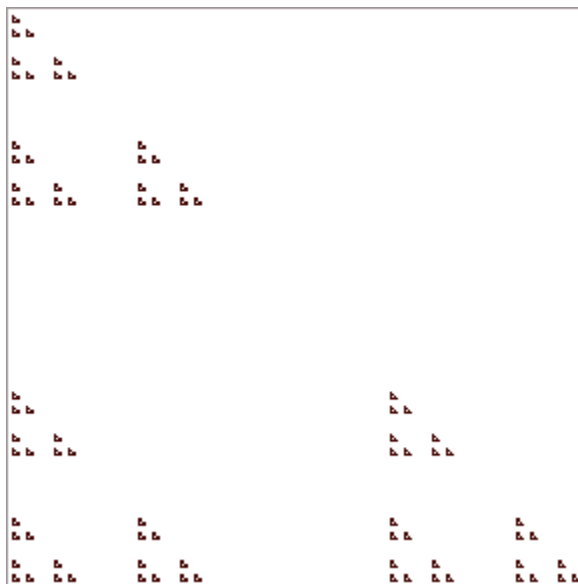
6. Figures (a), (b), (c), and (d) are f(α) curves, each generated by one of the driven IFS in figures (1), (2), (3), and (4). Say which IFS generates which f(α) curve. Explain each of your choices. Do not use the process of elimination.

(1)

(2)

(3)

(4)