

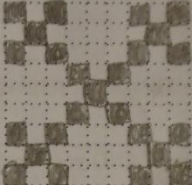


## Homework 4: ES p. 53 – Examples of answers that were full and correct:

For homework, I sometimes grade on correctness (selecting a few problems as samples of the whole), and I sometimes grade on completeness (depending on how much of the work we've done together in class). For pages 44-53 of your extended syllabus I "split the difference" and scored on both elements. Depending on how completely you had done the problems on these pages you earned up to 6 points. In terms of correctness I graded problem 43, which represented well what we had worked on most in class – understanding the images and finding dimension, perimeter and area. Each part of this problem was worth 1 point for a total of 4 points. This was basically the capstone problem, and you will have one like this on your next test for sure. You may need to magnify the page to see details.

43) Using the initiator and generator below, do the following four things. In a clearly organized and clearly labeled fashion, show your work in space at the bottom of this page.

(a) Draw stage 2 of this fractal on the grid provided.  
 (b) Find the dimension of this fractal.  
 (c) Find the perimeter of this fractal.  
 (d) Find the area of this fractal.

stage 0 initiator                  stage 1 generator                  stage 2

4 pts

C

D

$$= \frac{\log 5}{\log 3} = 1.46$$

C

Perimeter

$$4 + \frac{12}{3} + \frac{60}{9} + \dots$$

C

The perimeter is infinitely long  
 the ratio tells me the perimeter will  
 just keep growing.

C

Area

stage 0 = 1 unit  
 stage 1 =  $\frac{1}{9}$   
 stage 2 =  $\frac{1}{81}$

ratio:  $\frac{5}{9}$

$$1 - \left( \frac{4}{9} + \frac{20}{81} + \dots \right)$$

$$S = 1 - \left( \frac{\frac{4}{9}}{1 - \frac{5}{9}} \right) \quad 1 - 1 = 0$$

$$1 - \left( \frac{\frac{4}{9}}{\frac{4}{9} - \frac{5}{9}} \right)$$

$$\left( \frac{\frac{4}{9}}{\frac{-1}{9}} \right)$$

C

50