

## MATHEMATICS 201-BNJ-05

Topics in Mathematics

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Winter 2009

# Assignment #2

This assignment is due **Tuesday February 24, 2009** at the beginning of the class. Complete solutions with exact answers are expected.

For questions involving Maple, a print-out of your work is expected, where your name is written in the Worksheet, each question is clearly labeled, and the answers are clearly presented. Also, you must copy your file in my "TEST" subfolder (W:\Tests\mhuard\Topics\Assignment 2), where your name should be included in the name of the file (for example: Assignment 2 – Your Name).

## Part I

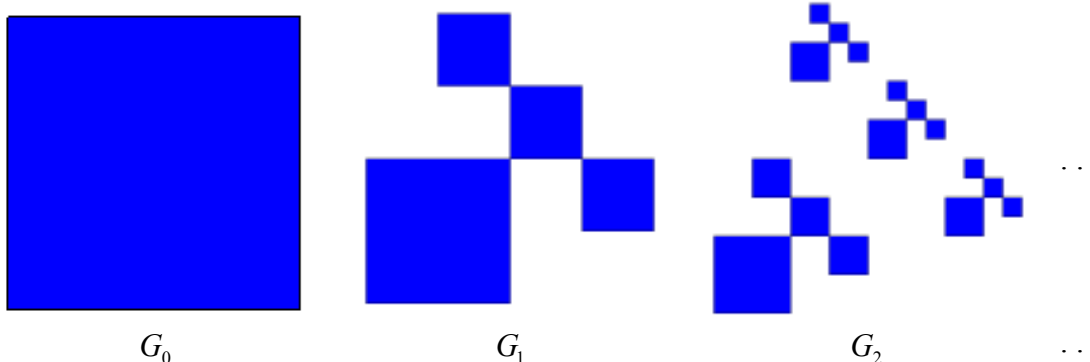
Do the following questions from the book.

- 2.3.16 page 7 (7 points)
- 3.2.12 page 70 (6 points)
- 3.2.32 page 72 (2 points)
- 3.3.18 page 76 (2 points)
- 4.1.26 page 85 (7 points)
- 4.2.14 page 91 + question 20 (related to 14) (4 points)
- 4.3.26 page 96 + questions 34 and 35 (relating to 26) (8 points)

## Part II

**Question 1** (8 points)

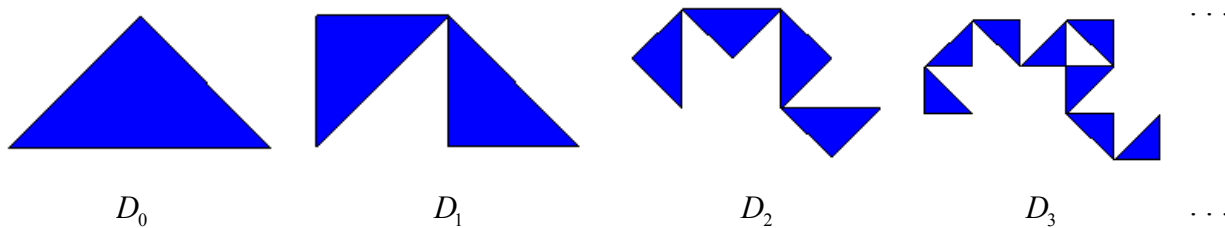
Consider the following sequence  $\langle G_n \rangle$  of geometric figures, where  $G_0$  is the unit square.



- a) Find the dimension of the limiting figure (you can use Maple). Is it a fractal?
- b) Give the recursive definition for the sequence  $\langle G_n \rangle$ .
- c) Use Maple to draw an approximation of  $G$ , where  $\langle G_n \rangle \rightarrow G$ .

**Question 2** (6 points)

Consider the following sequence  $\langle D_n \rangle$  of geometric figures, where  $D_0$  is an isosceles right triangle, with base of length 1. The limiting figure,  $\langle D_n \rangle \rightarrow D$  is called the.



- a) Give the recursive definition for the sequence  $\langle D_n \rangle$ .
- b) Use Maple to draw an approximation of  $D$ .