

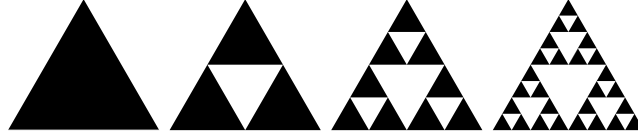
Math 123
Fall 2018
Dr. Lily Yen

Assignment 1

Show all your work

Name: _____
Number: _____
Signature: _____
Score: ____/16

Problem 1: Sierpinski triangle is a fractal: first take an equilateral triangle (stage 0), then draw a middle triangle (stage 1). Below shows the first three stages.



Count the number of *white* triangles (of all sizes) for each stage, and predict according to your pattern the number of *white* triangles of all sizes in the fourth stage.

Score: /3

Problem 2: Calculate the following:

$$\begin{array}{r} \text{a)} \quad 15 \\ \times 15 \\ \hline \end{array} \quad \begin{array}{r} \text{b)} \quad 25 \\ \times 25 \\ \hline \end{array} \quad \begin{array}{r} \text{c)} \quad 35 \\ \times 35 \\ \hline \end{array} \quad \begin{array}{r} \text{d)} \quad 45 \\ \times 45 \\ \hline \end{array}$$

Compare the answers with the numbers you multiplied. Look for a pattern to help you determine the following two product. 95×95 and 1000005×1000005

Score: /3

Problem 3: Decide whether each equation is true.

- a. $12 \times 42 = 21 \times 24$
- b. $13 \times 62 = 31 \times 26$
- c. $23 \times 96 = 32 \times 69$

Explain if this allows you to conclude that $37 \times 54 = 73 \times 45$?

Score: /2

Problem 4: As of September 2011, the three top-selling video games of all time, *Wii Sports*, *Super Mario Brothers*, and *Pokémon Red/Green/Blue*, sold a total of 118 million copies. If *Super Mario Brothers* sold 9 million more than *Pokémon* and 7 million less than *Wii Sports*, how many copies did *Pokémon* sell?

Score: /2

Problem 5: In a farm with turkeys and sheep (at least one of each), suppose you count a total of 30 legs, how many of each kind may be on the farm?

Suppose in addition, you count 24 eyes in total from the turkeys and sheep, how many of each kind do you have?

Score: /3

Problem 6: First define both inductive reasoning and deductive reasoning.

a. Inductive reasoning:

b. Deductive reasoning:

Determine the type of reasoning the following situation illustrates: You use Google Maps' estimated time for a trip from Montreal to Québec City and calculate that to make that time, you will have to drive over 108 km/h where the speed limit on the highway is 100 km/h.

Score: /3