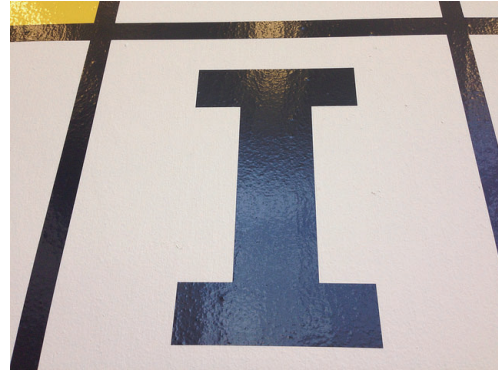


Key

Lesson 2 I Rule!

A Solidify Understanding Task

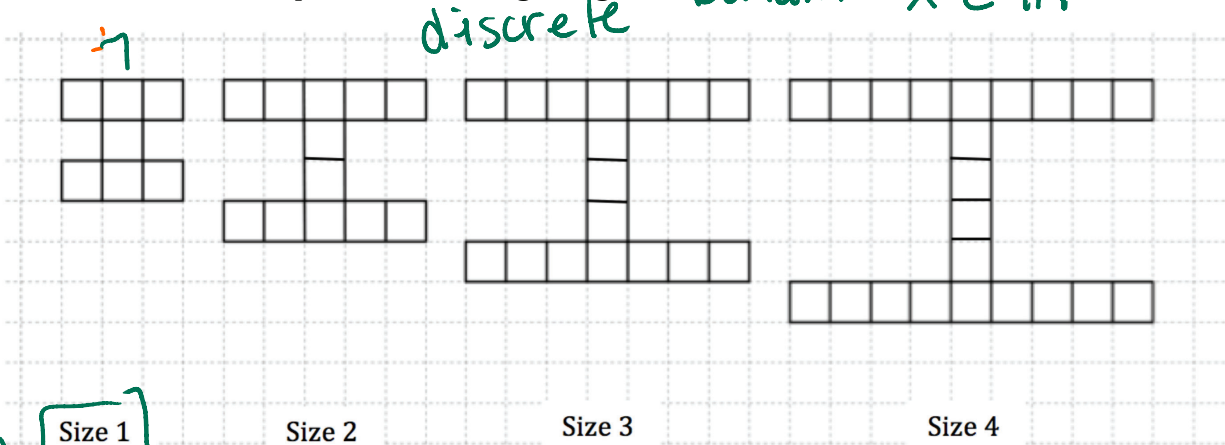


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Marco has started a new blog about sports at Imagination High School (mascot: the fighting unicorns) that he has decided to call "I Site". He created a logo for the web site that looks like this:



He is working on creating the logo in various sizes to be placed on different pages on the website. Marco developed the following designs:



discrete Domain: $x \in \mathbb{N}$

	$f(x)$ Linear	1st, Constant
0	2	
1	7	
2	12	+5
3	17	+5

size Size 1

1. How many squares will be needed to create the size 100 logo? 502

2. Develop a mathematical model for the number of squares in the logo for size n .

Explicit: $f(x) = 5x + 2$ ^{2nd term} Recursive: $\begin{cases} f(x) = f(x-1) + 5 \\ f(1) = 7 \end{cases}$
 or $f(x) = 7 + 5(x-1)$

Marco decides to experiment with making his logo “blockier” so that it looks stronger.

Here’s what he came up with:

Size 1

Size 2

Size 3

Explicit

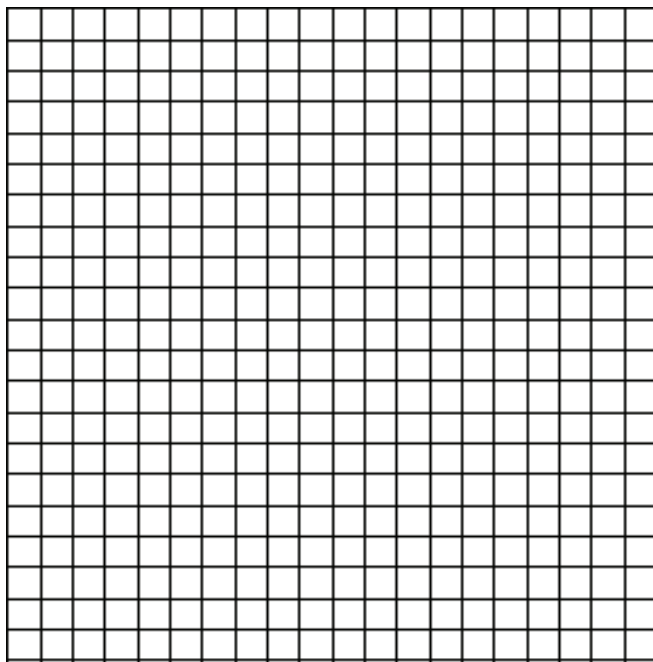
$$f(x) = 7x^2$$

Quadratic

$$\begin{cases} f(x) = f(x-1) + 14x - 7 \\ f(1) = 7 \end{cases}$$

a line

3. Assuming that Marco continues with the pattern as it has begun, draw the next figure, size 4, and find the number of blocks in the figure.



x	Quadratic f(x)	Linear 1st	Constant 2nd diff
0		-7	+14
1	7	+7	+14
2	28	+21	+14
3	63	+35	+14
4	112	+49	+14

4. Develop a mathematical model for the number of blocks in a logo of size n .

Explicit :

$$f(x) = 7x^2$$

Recursive :

$$\begin{cases} f(1) = 7 \\ f(x) = f(x-1) + 14x - 7 \end{cases}$$

5. Compare the models that you developed for the first set of logos to the second set of logos. In what ways are they similar? In what ways are they different?

model 1 is linear (add a constant)

model 2 is quadratic (add a line)

They both contain the point $(1, 7)$
and they are both increasing.