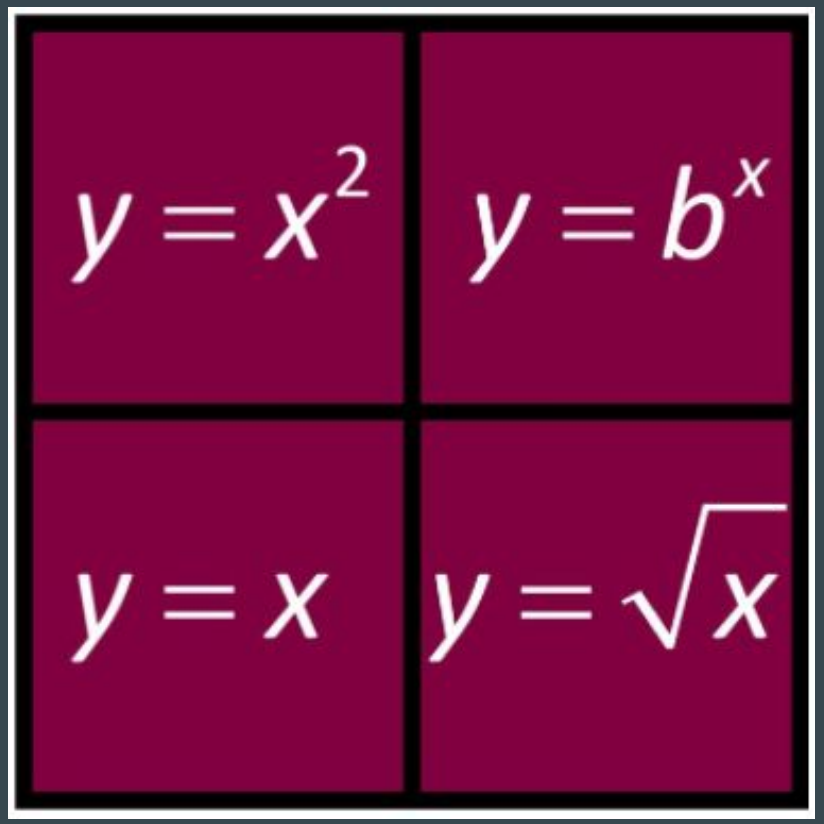
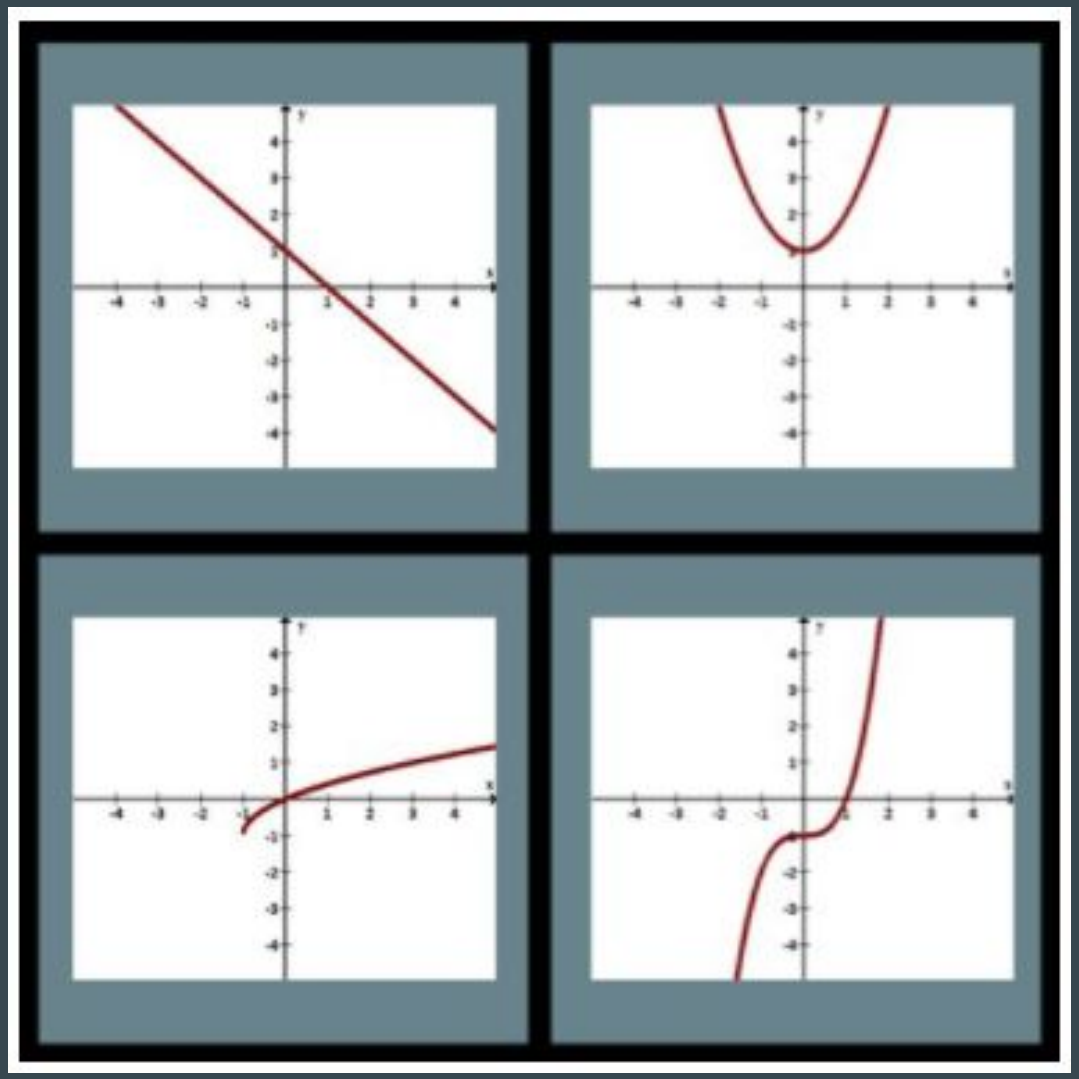
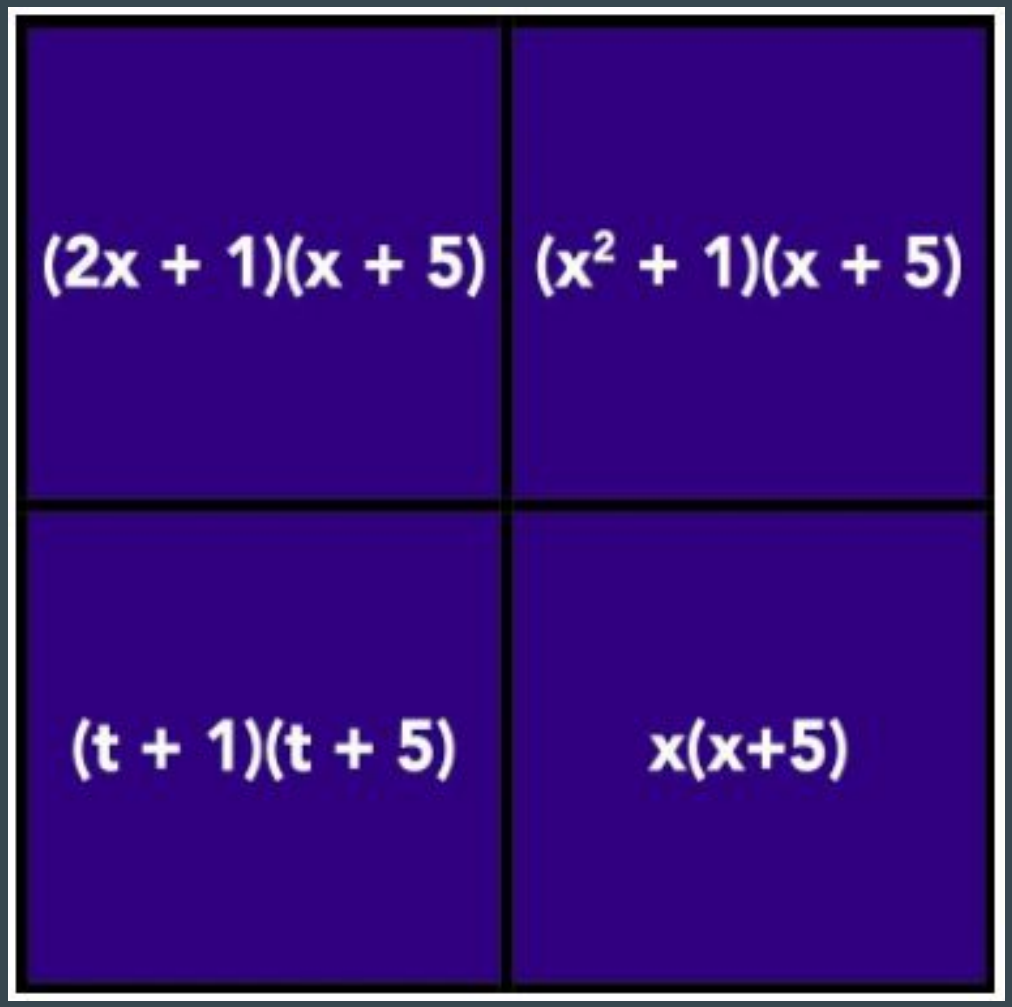
WODB?

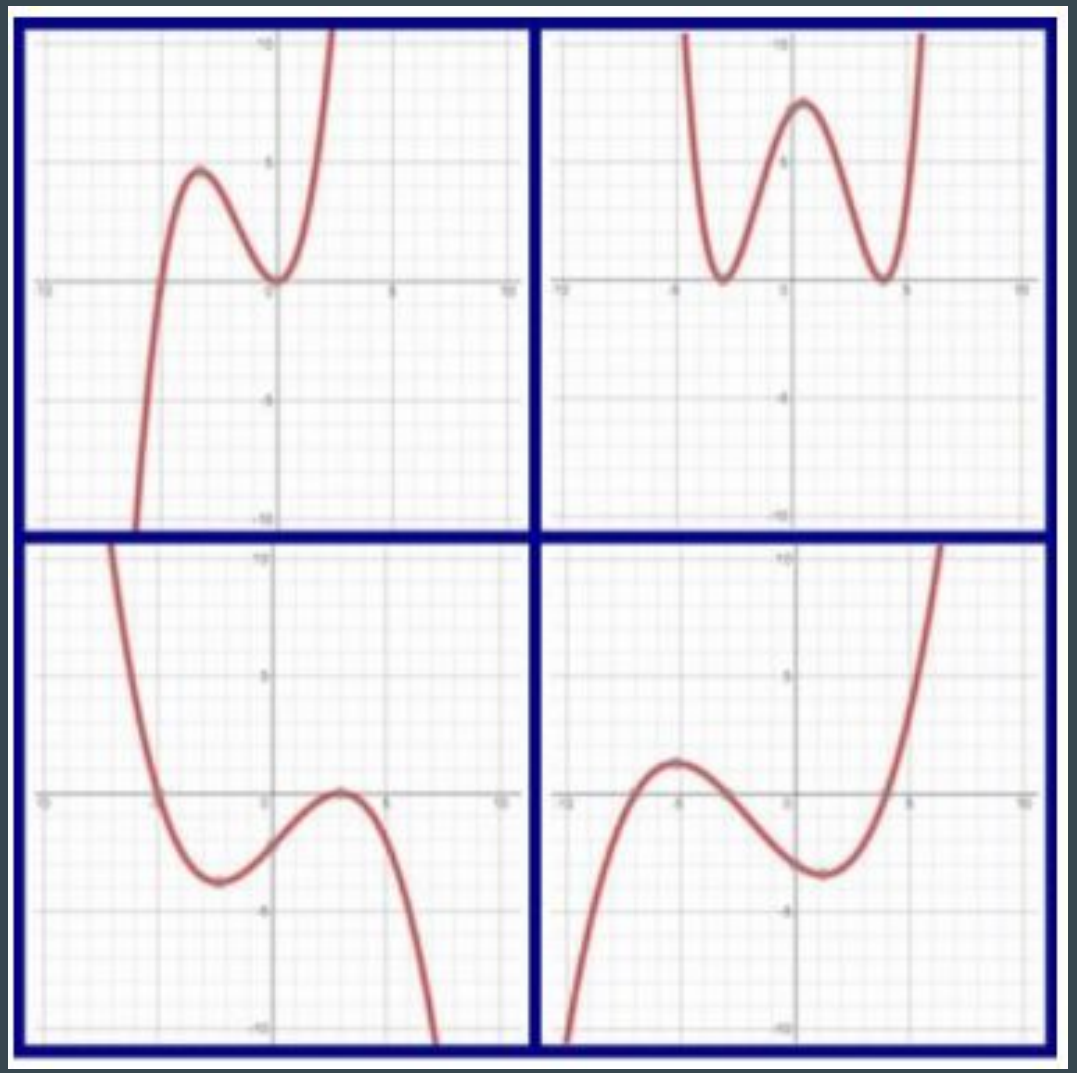
...

$y = 4x + 3$	$y = -4x + 5$
$y = \frac{1}{4}x + 5$	$y = 4x - 5$


$y = x^2$
$y = b^x$
$y = x$
$y = \sqrt{x}$



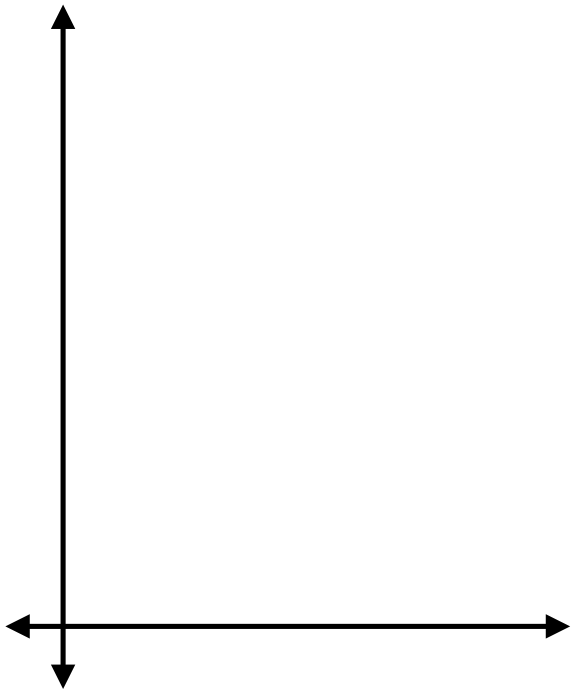

(2x + 1)(x + 5)
(x² + 1)(x + 5)
(t + 1)(t + 5)
x(x+5)



RULE OF FOUR: FOLDING PAPER PROBLEM

Equation

Graph



Table

x Folds Avery Made	f(x) Number of Rectangles
0	3
1	

Context

Avery wondered if any patterns would emerge from repeatedly folding paper. She started with a sheet of rectangular paper already folded into thirds. She folded that in half, forming 6 rectangles. In her second fold, she again folded in half, and in half again, etc. How many rectangles would result from Avery's sixth fold?

RULE OF FOUR: FOLDING PAPER PROBLEM

Equation

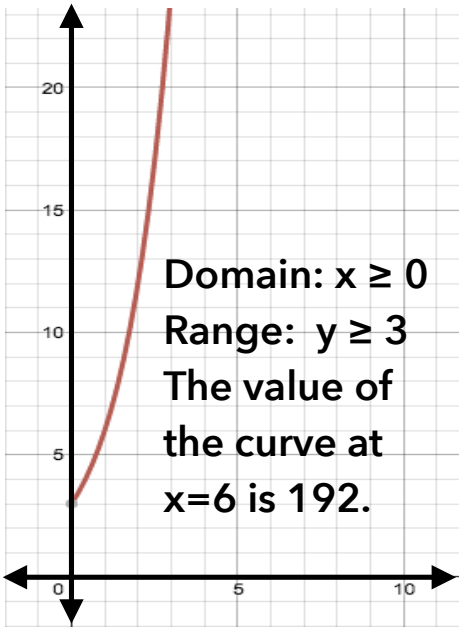
$$f(x) = 3(2^x)$$

$$f(6) = 3(2^6)$$

$$f(6) = 3(64)$$

$$f(6) = 192$$

Graph



Domain: x ≥ 0
Range: y ≥ 3
The value of the curve at x=6 is 192.

Table

x Folds Avery made	f(x) Number of Rectangles
0	3
1	6
2	12
3	24
4	48
5	96
6	192

Context

Avery wondered if any patterns would emerge from repeatedly folding paper. She started with a sheet of rectangular paper already folded into thirds. She folded that in half, forming 6 rectangles. In her second fold, she again folded in half, and in half again, etc. How many rectangles would result from Avery's sixth fold?

192 rectangles would result from Avery's sixth fold.

Toothpick Trains

Context

Tommy was building toothpick trains. One train needs 4 toothpicks. Two trains need 7 toothpicks. Three trains need 10 toothpicks, and so on

1 train 2 trains 3 trains

How many toothpicks are needed to build eight trains?

How many trains can be built with 280 toothpicks?

Table of Values

x	y

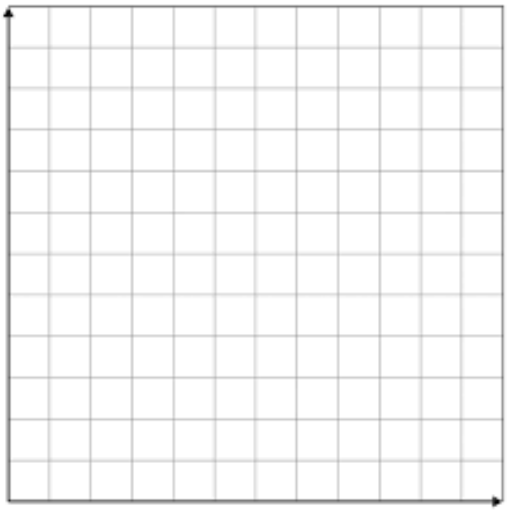
x represents:

y represents:

Equation(s)*

*Write more than one equation, using the context as a way to support your equation. Use the equations to solve the posed problems.

Graph



Iterations of the Box Fractal

Context

To make a Box Fractal, start with an initial square of area 1 unit^2. Call this "Stage 0". Fractals are made by performing repeated iterations of a specific process onto an initial shape. Box fractals are made by dividing each colored square into 9 congruent parts, and erasing four of the nine squares, as shown below.

Stage 0 Stage 1 Stage 2

How many colored-in squares would there be in Stage 4 of the Box Fractal?

What would be the total area of the colored squares in Stage 4 of the Box Fractal?

Table of Values

x	$f(x)$	$g(x)$
0		
1		
2		
3		
4		
n		

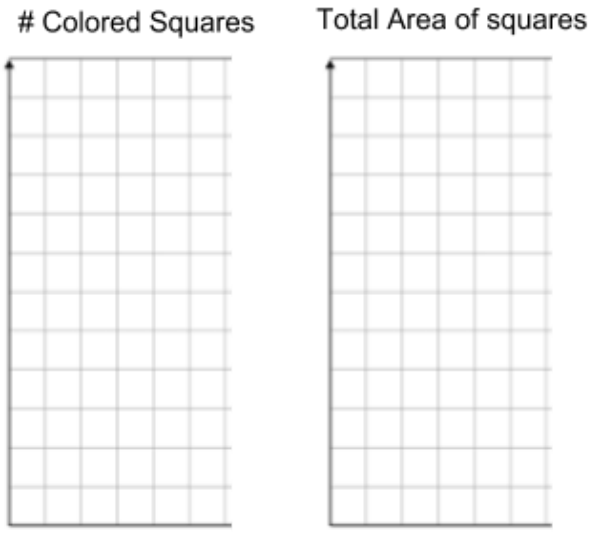
x represents: _____

$f(x)$ represents: _____

$g(x)$represents: _____

Equations

Graphs



1.

Function Machine ala Desmos - This game is played between two or more players. Player #1 makes up a function rule in his head. Player #2 gives an input value. Player #1 uses his rule to give the output. Player #1 gives another input. and player #2 gives the output. Desmos is used to plot the points. Player #2 guesses the function rule, using correct function notation. Players #1 and 2 switch roles. The player that wins is the one who correctly guesses the function rule in fewer guesses. This game helps students build connections between multiple representations. Once the function's symbolic form is determined, a story problem is written to match the context. Adjust the domain and range as appropriate in the symbolic form, which will adjust the graphical form.

2.

x_1	y_1
0	1.5
4	3.5
2	2.5
22	12.5
52	27.50

3.

$$f(x) = 0.5x + 1.5 \ \ \{x \geq 0\}$$

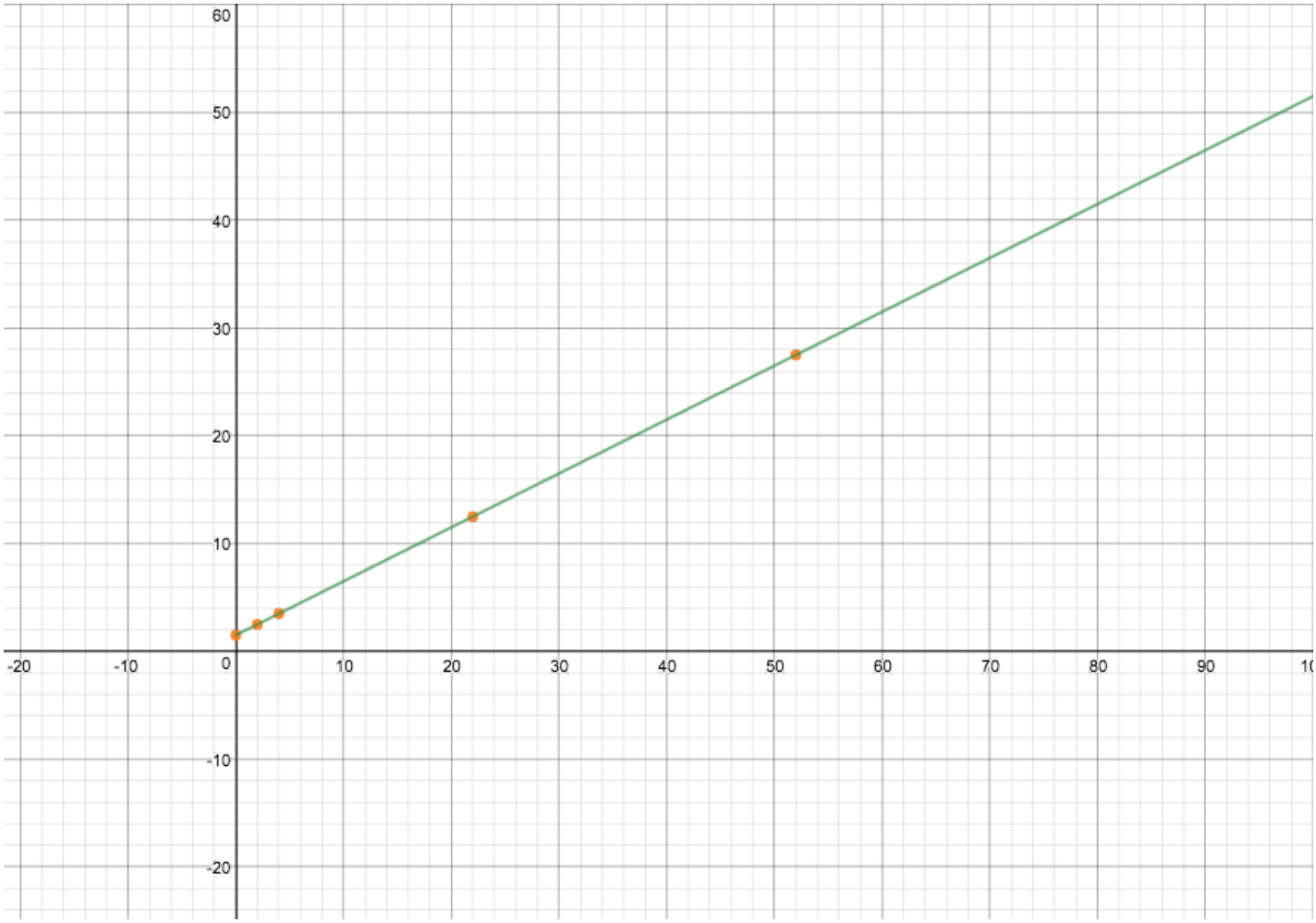
4.

Context: For Sally's birthday, she received a piggy bank with $1.50 in it. Each week she added $0.50 to her piggy bank. She did not withdraw any money. How many weeks would it take until Sally's piggy bank has $12.50? How much money would be in Sallly's piggy bank in 52 weeks?

5.

$$f(52)$$

$= 27.5$


60
50
40
30
20
10
-20
-10
0
10
20
30
40
50
60
70
80
90
-10
-20