Why does the height of the array tell us everything we need to know about the size of the array?

Because the array is a square its size (area) is found by squaring the length of any one of its sides.

And the height gives us the length of a side.

What are the two variables in this situation?

the height of the array and the # faces painted

Which variable is the independent and which is the dependent?

Independent = height

Dependent = # faces painted

SAS4 - Topic 2

Answer question #1

SAS4 - Topic 2 Answer question #2

height in cubes	# painted faces
1	1
2	4
3	9
4	16
5	25

First Difference: 3, 5, 7, 9

Second Difference: 2, 2, 2

when there is a constant second difference the data can be modeled with a:

Quadratic Function

SAS4 - Topic 2 Answer question #3

3. **REINFORCE** Could a quadratic function model the data in the table below? Justify your answer.

x	y
-2	5
-1	0
0	-1
1	2
2	9

1st difference: -5, -1, 3, 7

2nd difference: 4, 4, 4

NOT LINEAR since 1ST differences are not constant

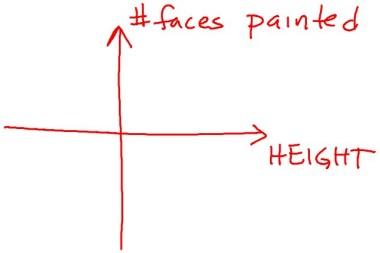
Yes, must be a Quadratic function since 2nd differences are CONSTANT

What would a graph of this situtation look like?

A parabola

SAS4 - Topic 2

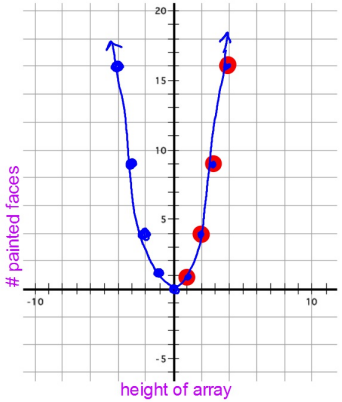
Answer question #'s 4 & 5



4. Make a scatterplot that represents the data from the problem situation. Then sketch a complete graph of the function rule that models the problem situation.

Problem Situation:

height in cubes	# painted faces
1	1
2	4
3	9
4	16
5	25



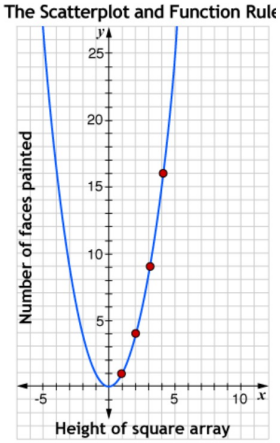
Function Rule:

$y = x^2$

x	y
-4	16
-3	9
-2	4
-1	1
0	0

SAS4 - Topic 2

Answer question # 6



Function Rule: $y = x^2$

Domain:	Range:
All Real #'s	$y \geq 0$
$(-\infty, \infty)$	$[0, \infty)$

Problem Situation:

Domain:	Range:
Counting Numbers	Squares of the Counting Numbers

What do you think the graph of the inverse relation will look like?

Sideways Parabola ?

[a reflection of $y=x^2$ over the line $y=x$]

What do you think the function rule for the inverse will be?

$y = \sqrt{x}$

SAS4 - Topic 2

Answer question # 7

SAS4 - Topic 2

Answer question # 8

Function Rule for the Inverse of $y = x^2$

1. Start by switching x and y

   $x = y^2$

2. Then solve for y

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

$$y = \sqrt{x}$$

Since both the original function and the inverse can be written in y= form it can be confusing as to which one is the original and which one is the inverse.

Therefore, there is a symbol used to indicate the inverse:

Original Function:

$y = x^2$

or

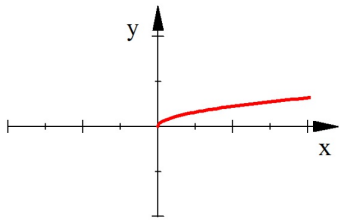
$f(x) = x^2$

Inverse Function:

$f^{-1}(x) = \sqrt{x}$

the -1 isn't an exponent it's just a symbol used to indicate it is an inverse relation.

Graph $y = \sqrt{x}$ on the graphing calculator.



What is the Domain and Range?

Domain: $x \geq 0$ $[0, \infty)$

Range: $y \geq 0$ $[0, \infty)$

Hwk #10: Topic 2 - SAS4 questions 9-11