ALGEBRA 2

Flamingo Math

G.N.A.W. on Inverse Functions   Name _____

Graph	Numerically
$f(x) = x^2 + 2; \ x \geq 0$	$f(x) = x^2 + 2; \ x \geq 0$

GRAPHIC
NUMERIC
ALGEBRAIC
WORDS

G.N.A.W. on Inverse Functions   Name _____

Graph	Numerically
$f(x) = \sqrt[3]{x-3} - 2$	$f(x) = \sqrt[3]{x-3} - 2$

Numerically table:

x	$f(x)$		x	$f^{-1}(x)$

Algebraic	Verbally

FREEBIE!

GNAW on Inverse Functions
The Rule of Four

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GNAW on Inverse Functions

In this GNAW Activity your Algebra 2 or PreCalculus students will explore problems that can be represented *graphically, numerically, analytically, and verbally*. They will make connections among these representations. There are two different versions.

What is GNAW and the Rule of Four?

The "Rule of Four" or G.N.A.W. Approach is a method of thinking about mathematics in order to make connections through multiple representations of our mathematical thinking. Students should be able to represent mathematics in graphic, numeric, algebraic, and verbal formats. G.N.A.W.

Why should you use the GNAW approach?

By implementing this process into your classes, students will gain a deeper understanding of the mathematics. The Rule of Four helps students connect and validate concepts and techniques.

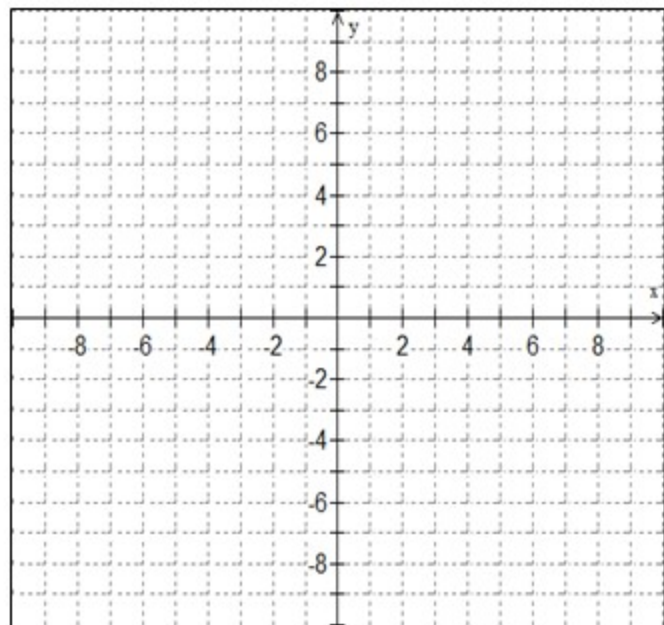### How can you use the Rule of Four?

Teachers can model this approach during instructional time to set the "tone" for expected thinking and reasoning. Then, give your students many chances to practice the techniques. It is also important that students learn to make connections between the different representations.

G.N.A.W. on Inverse Functions Name _____

Graph

$$f(x) = x^2 + 2; \ x \geq 0$$

Numerically

$$f(x) = x^2 + 2; \ x \geq 0$$

x	$f(x)$

x	$f^{-1}(x)$

Algebraic

Find the inverse algebraically.

Verbally

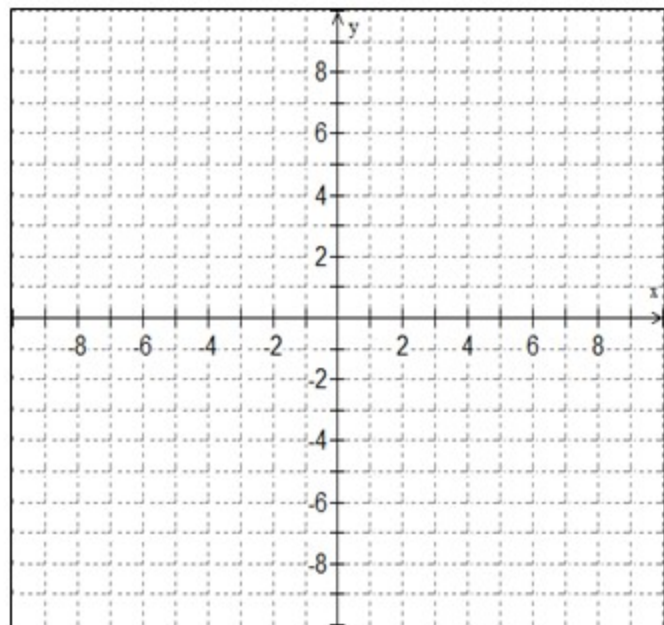Use the table and the graph to answer the following:

$$f(x) = x^2 + 2; \ x \geq 0$$

	Function	Inverse
Domain:		
Range:		
x-intercept		
y-intercept		

G.N.A.W. on Inverse Functions

Name _____

Graph

$$f(x) = \sqrt[3]{x-3} - 2$$

Numerically

$$f(x) = \sqrt[3]{x-3} - 2$$

x	$f(x)$

x	$f^{-1}(x)$

Algebraic

Find the inverse algebraically.

Verbally

Use the table and the graph to answer the following:

$$f(x) = \sqrt[3]{x-3} - 2$$

	Function	Inverse
Domain:		
Range:		
x-intercept		
y-intercept		

G.N.A.W.

Name _____

ENTER TEXT HERE

Graph	Numerically
ENTER TEXT HERE	ENTER TEXT HERE
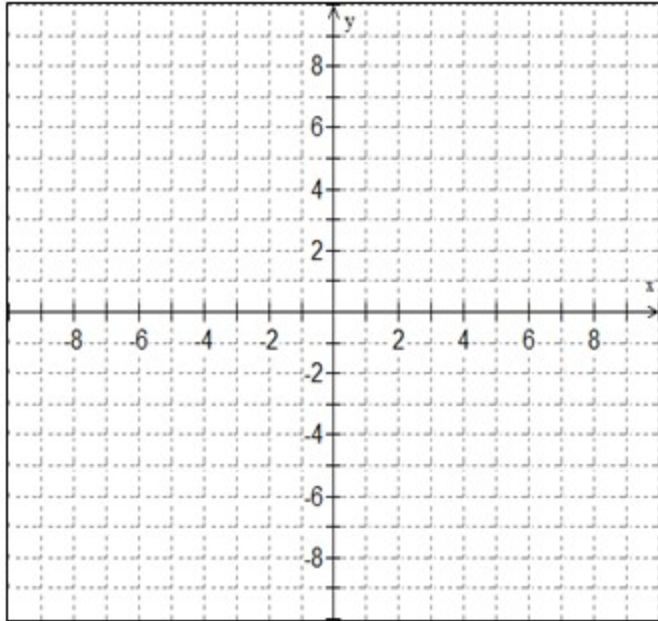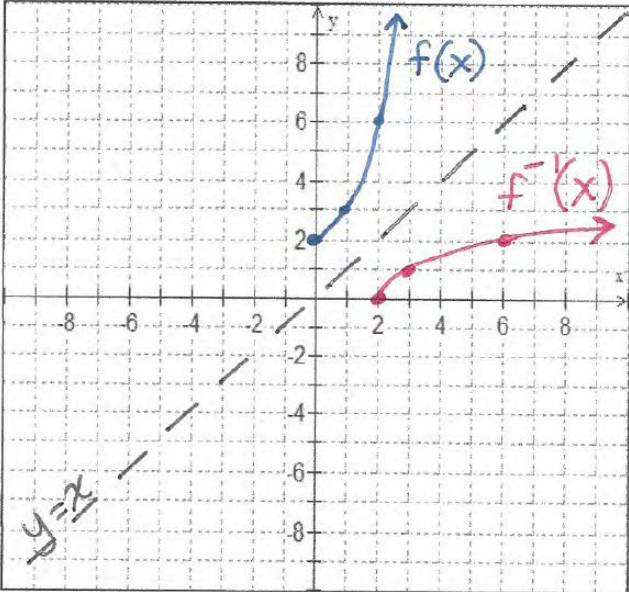
Algebraic	Verbally
ENTER TEXT HERE	ENTER TEXT HERE

G.N.A.W. on Inverse Functions   Name ___Key___

Graph	**Numerically**

Graph

$f(x) = x^2 + 2; \; x \geq 0$

Numerically

$f(x) = x^2 + 2; \; x \geq 0$

x	$f(x)$
0	2
1	3
2	6
3	11
4	18
5	27
6	38

x	$f^{-1}(x)$
2	0
3	1
6	2
11	3
18	4
27	5
38	6

Algebraic

Find the inverse algebraically.

$y = x^2 + 2 \qquad x \geq 0$

$x = y^2 + 2$

$y = \sqrt{x-2}$

$f^{-1}(x) = \sqrt{x-2} \; ; \; x \geq 2$

Verbally

Use the table and the graph to answer the following:

$f(x) = x^2 + 2; \; x \geq 0$

	Function	Inverse
Domain:	$[0, \infty)$	$[2, \infty)$
Range:	$[2, \infty)$	$[0, \infty)$
x-intercept	none	$(2, 0)$
y-intercept	$(0, 2)$	none

G.N.A.W. on Inverse Functions   Name ___Key___

Graph

$$f(x) = \sqrt[3]{x-3} - 2$$
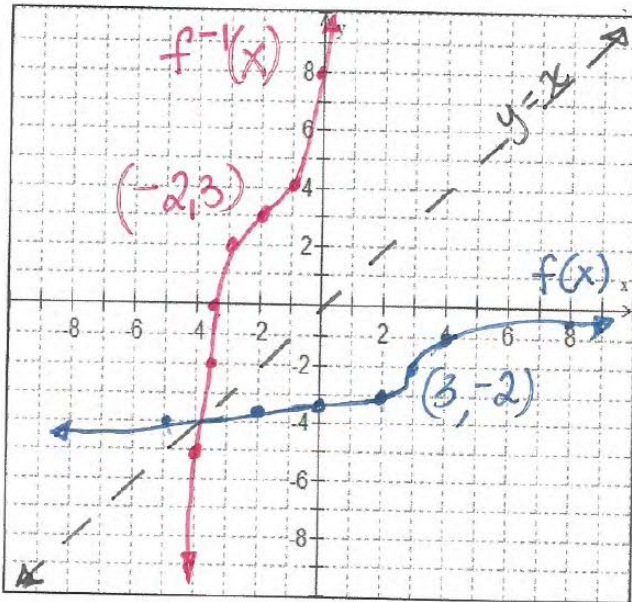
Numerically

$$f(x) = \sqrt[3]{x-3} - 2$$

x	$f(x)$
-5	-4
-2	-3.7
0	-3.4
2	-3
3	-2
4	-1
8	-0.3

x	$f^{-1}(x)$
-4	-5
-3.7	-2
-3.4	0
-3	2
-2	3
-1	4
0	8

Algebraic

Find the inverse algebraically.

$$y = \sqrt[3]{x-3} - 2$$

$$x = \sqrt[3]{y-3} - 2$$

$$x+2 = \sqrt[3]{y-3}$$

$$(x+2)^3 = y-3$$

$$y = (x+2)^3 + 3$$

$$\underline{f^{-1}(x) = (x+2)^3 + 3}$$

Verbally

Use the table and the graph to answer the following:

$$f(x) = \sqrt[3]{x-3} - 2$$

	Function	Inverse
Domain:	$(-\infty, \infty)$	$(-\infty, \infty)$
Range:	$(-\infty, \infty)$	$(-\infty, \infty)$
x-intercept	$(11, 0)$	$(-3.4, 0)$
y-intercept	$(0, -3.4)$	$(0, 11)$

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Jean Adams
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