Bellwork:

This month, Kami sold 70 figurines in 2 sizes. The large figurines sold for \$12 each, and the small figurines sold for \$8 each. The amount of money he received from the sales of the large figurines was equal to the amount of money he received from the sales of the small figurines. How many large figurines did Kami sell this month?

A. 20
B. 28
C. 35
D. 42
E. 50

In a plane, the distinct lines $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect at A, where A is between C and D. The measure of $\angle BAC$ is 47°. What is the measure of $\angle BAD$?

A. 43°
B. 47°
C. 94°
D. 133°
E. 137°

Sit anywhere but the back row!

Test Results: Class Average: 66.2%

High Score: 121%

9) $r_1 = \frac{1}{10}\ \frac{\text{pool}}{\text{hr}}$ $r_1 + r_2 = \frac{1}{4}\ \text{pool/hr}$

$r_2 = \frac{3}{20}\ \frac{\text{pool}}{\text{hr}}$ $\frac{1}{10} + r_2 = \frac{5}{20} - \frac{1}{10}$ $\frac{2}{2}$

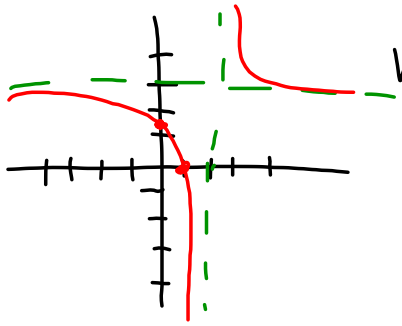
$\frac{20}{3} =$ 6.67 hrs/pool $r_2 = \frac{5}{20} - \frac{2}{20}$

10) $\frac{3x-3}{x-2}$ $\frac{3(x-1)}{x-2}$

$3x - 3 = 0$

$+3 \quad +3$

$\frac{3x}{3} = \frac{3}{3}$



x-int: (1,0)

y-int: $(0, \frac{3}{2})$

vert: $x = 2$

horz: $y = 3$

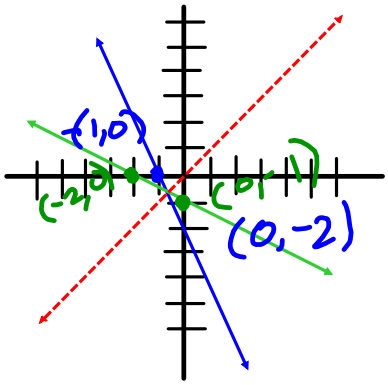
Lesson 5.1 Objectives:

I can find the inverse of a function

INVERSE FUNCTIONS: functions in which all input and output pairs are reversed.

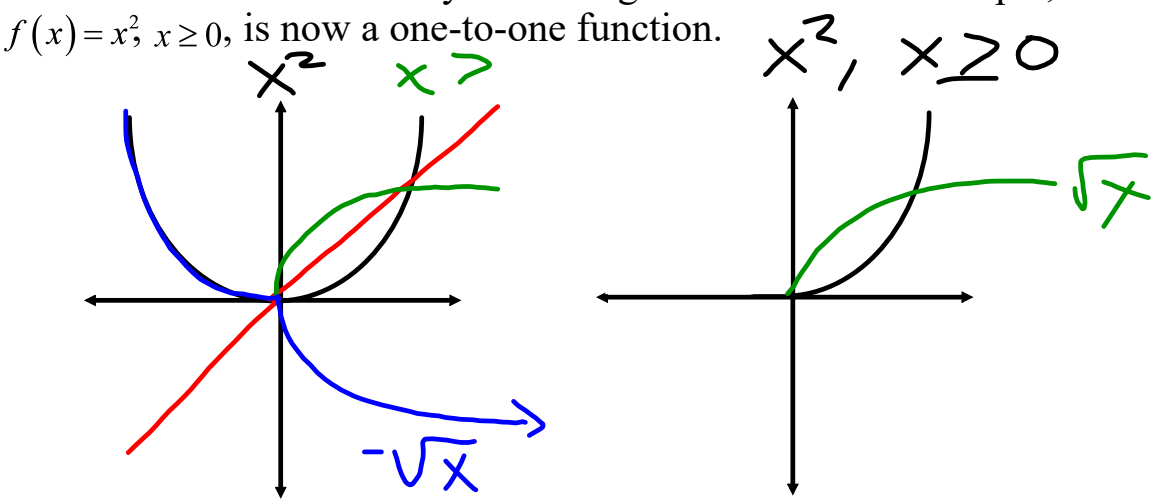
The inverse of $f(x)$ is denoted $f^{-1}(x)$. Inverse functions have the following properties:

- $f(x)$ and $f^{-1}(x)$ are reflections of each other across the line $y = x$.
- For every point (a, b) on $f(x)$, there is a point (b, a) on $f^{-1}(x)$.
- The domain of $f(x)$ is the range of $f^{-1}(x)$; the range of $f(x)$ is the domain of $f^{-1}(x)$.



***ONE-TO-ONE FUNCTION:** a function that, when graphed, passes the horizontal line test.

Note that a function such as $f(x)=x^2$, which is not one-to-one, can be made one-to-one by restricting its domain. For example, $f(x)=x^2;\ x\geq 0$, is now a one-to-one function.



STEPS FOR FINDING THE INVERSE FUNCTION

1. Substitute x for $f(x)$, substitute y for x.
2. Solve for y.
3. Substitute $f^{-1}(x)$ for y.
4. Check for necessary domain restrictions.

1. $f(x) = 5x + 7$

$x = 5y + 7$

$-7 \quad -7$

$x - 7 = 5y$

$\frac{x-7}{5} = \frac{5y}{5}$

$y = \frac{x-7}{5}$

$f^{-1}(x) = \frac{x-7}{5}$

1. $f(x) = -6x + 8$

$x = -6y + 8$

$-8 \quad -8$

$x - 8 = -6y$

$\frac{x-8}{-6} = \frac{-6y}{-6}$

$f^{-1}(x) = -\frac{x-8}{6}$

2. $f(x) = x^2 - 6x + 13$ *when* $x \leq 3$.

$x = y^2 - 6y + 9 - 9 + 13$

$x = (y-3)^2 + 4$

$-4 \quad -4$

$\pm\sqrt{x-4} = (y-3)^2$

$3 \pm \sqrt{x-4} = y-3$

$+3$

$y = 3 \pm \sqrt{x-4}$

$f^{-1}(x) = 3 - \sqrt{x-4}$ If $x \geq h$, $\sqrt{x}$

If $x \leq h$, $-\sqrt{x}$

3) $x^2 - 4x - 12 \quad x \geq 2$

$x = y^2 - 4y + 4 - 4 - 12$

$x = (y-2)^2 - 16$

$+16 \quad +16$

$\sqrt{x+16} = (y-2)^2$

$2 \pm \sqrt{x+16} = y-2$

$+2$

$f^{-1}(x) = 2 + \sqrt{x+16}$

Example 3:

Find the inverse of $f(x)=\frac{4x+3}{3x-1}$.

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

$3xy-x=4y+3$ $+x$

$-4y$ $+x$ $-4y$

$3xy-4y=x+3$

$\frac{y(3x-4)}{3x-4}=\frac{x+3}{3x-4}$

$F^{-1}(x)=\frac{x+3}{3x-4}$

6) $x=\frac{7y-6}{3y+2}$

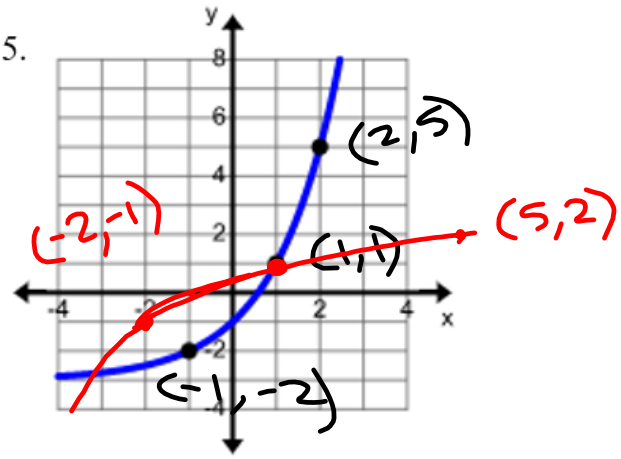
4.

x y

x	$f(x)=x^3-4x+1$
-7	-314
-6	-191
-5	-104
-4	-47
-3	-14
-2	1
-1	4

X	$F^{-1}(x)$
-314	-7
-191	-6
-104	-5
-47	-4
-14	-3

5.



6. Find a domain that will make this function invertible.

$f(x) = x^2 - 4x - 1$

$\frac{4}{2} = 2$

$x^2 - 4x + \_ - \_ - 1$

$(x-2)^2$

$x \geq 2$

$x \leq 2$