Intro to Inverse Functions

UNIT 8 LESSON ____ INVESTIGATION ____ NOTES

Lesson Vocabulary

Domain - All x-values of a function.

Range - All y-values of a function.

Function f(x) - Each element of the domain (x) has exactly one element of the range (y).

(Vertical line test)

function

not a function

Inverse Function $f^{-1}(x)$ - Reverses the action of a function. Each element of the range (y) has exactly one element of the domain (x).

(Horizontal line test)

Not a Function

function

* Use horizontal line test to check if a function has an inverse.
* From coordinates, make sure that there is not more than one of the same y-value, if there is, there is no inverse.

Adjusting Domain - Adjust domain of the original function if it does not have an inverse. Work with the max/min of the graph by taking chunks of the graph so that it passes the horizontal line test.

Example Problem(s)

ex.) Give the domain and range, then decide if the function has an inverse

a) $\{(-7,3),(0,0),(2,5),(-1,2)\}$

d: $\{-7, 0, 2, -1\}$

r: $\{3, 0, 5, 2\}$

Yes, there is a function.
Every y-value has one x-value

b) $\{(2,6),(-2,0),(-3,6)\}$

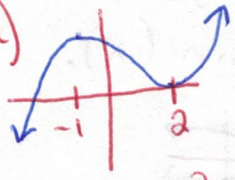
d: $\{2, -2, -3\}$

r: $\{6, 0, 6\}$

Does not have an inverse.
The y-value of 6 has two diffent x-values.

ex.) Does the function have an inverse? If no, adjust the doman so there is an inverse.

a)

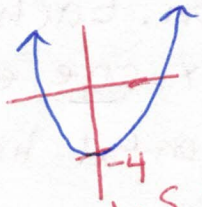


NO. d: $\{x \leq -1\}$
d: $\{-1 \leq x \leq 2\}$
d: $\{x \geq 2\}$

b)

Yes

c)



NO. d: $\{x \leq -4\}$
d: $\{x \geq -4\}$

ex.) Describe <u>in</u> <u>words</u> how to solve for x. Do not solve.

a) $y = 7x + 2$

Subtract 2,
Divide by 7

b) $y = \frac{3x-4}{9}$

multiply by 9, add 4,
then divide by 3.