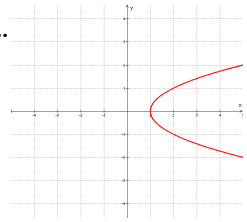
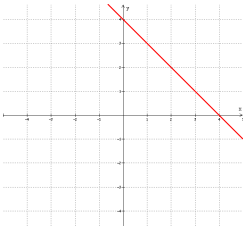
EVEN HW SOLUTIONS:

12.



14.

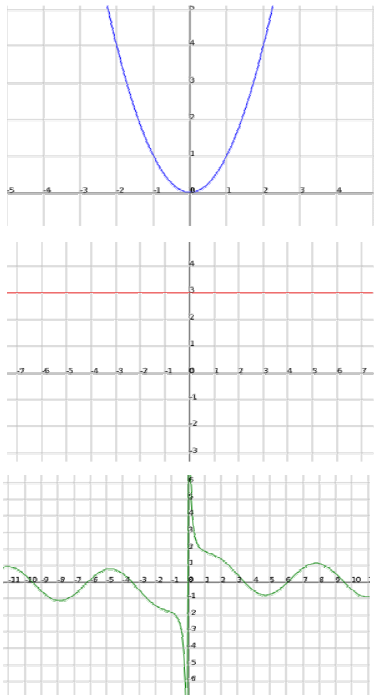


INVERSE FUNCTIONS!

How do we know when the inverse is going to be a function and when it is not?

NEW MATERIAL

Will the inverses of these functions below be functions?



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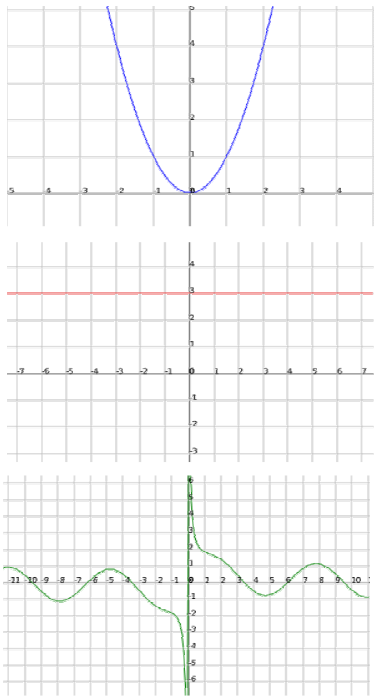

HORIZONTAL LINE TEST: if a function passes the test, then the inverse is also a function!

Terminology: A function whose inverse is also a function is called "one - to - one"

[in other words, a function which passes the horizontal line test is "one to one"]

WHY is it called ONE TO ONE?

(1) every x coordinate has only one y coordinate
(2) every y coordinate has only one x coordinate

1. Graph the equation $y=x^2+1$ by hand. Then reflect the graph across the line $y=x$ to obtain the graph of its inverse.

2. Given $f(x)=\sqrt[3]{x}$, prove that it is one-to-one.

3. Find the inverse of $f(x)=4/(x+7)$. Is the inverse a function?

If f is one-to-one*,
then we know f has an inverse function

*passes horizontal line test

If f is a one-to-one function,

then we write the inverse function f^{-1}

The -1 in f^{-1} is not an exponent

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The -1 in f^{-1} is not an exponent

so...

is f^{-1} the same as $1/f$?

NO!

If $f(x)=2x-3$, what is $f^{-1}(x)$?

one last theorem

THEOREM:

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

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

Let's try this out:

$f(x)=5x+8$

PART A: Find $f^{-1}(x)$
PART B: Find $f(f^{-1}(x))$
PART C: Find $f^{-1}(f(x))$

On page 358 in the book,
do:

part A) #71-76
part B) carefully sketch 77 in your notebooks
part C) #89-96 (but no need to graph)
part D) #97,98