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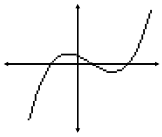
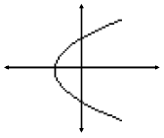
Domain & Range

Vertical Line Test - Use this to determine if a relation is a function.

Function



Not a Function



When we find the inverse of a function, we switch the x and y, thus also switching the domain and range, and reflecting the curve in the line y = x.
Therefore, we can use the horizontal line test on a function to determine if its inverse is also a function.

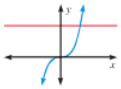
HORIZONTAL LINE TEST You can use the graph of a function f to determine whether the inverse of f is a function by applying the *horizontal line test*.

KEY CONCEPT *For Your Notebook*

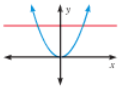
Horizontal Line Test

The inverse of a function f is also a function if and only if no horizontal line intersects the graph of f more than once.

Inverse is a function



Inverse is not a function



Domain & Range - cont.

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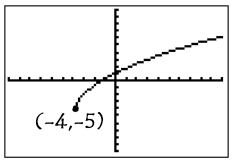
Domain and Range – from a graph

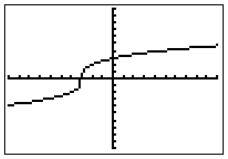
Domain - Identify all x values that are graphed. (Scan to the left and to the right.) Use an inequality to describe.

Range - Identify all y values that are graphed. (Scan down and up.) Use an inequality to describe.



D: $x \geq -4$
R: $y \geq -5$

D: all Real
R: all Real



Domain and Range – from an equation

Domain - Identify x-values that produce real numbers. Usually easiest to start with "all real numbers" then eliminate x-values that:
-make denominators equal to 0.
-create negative values inside even roots.

$f(x) = \frac{x^2+1}{x+2}$ D: Real, $x \neq -2$

$f(x) = x^{\frac{1}{2}} + 7$
$f(x) = \sqrt{x} + 7$
D: Real, $x \geq 0$

Range - Identify all possible output values for the function. Usually easiest to start with "all real numbers" then examine the function and check to see if it produces only certain values, like only positives, etc.

$f(x) = \sqrt{x+2} + 7$

D: $x \geq -2$
R: $y \geq 7$

p. 449/ # 11 - 20, Sketch, number appropriately, state domain and range, compare to parent graph, # 35, 36, 38, 39
Due Wednesday, Feb 12

$y = \sqrt{(x)} - 4$

$y = \sqrt{(x-4)}$