Important

Math 1505 is a HUGE course. Many students fear the course, but you don't need to, you've got us! Your keys to success are to practice as many types of problems as possible and not to fall behind. Each chapter builds on the concepts of a previous chapter so it's crucial to understand the material from one chapter before moving on.

This is where MATH1505.COM comes in. We have developed extensive tutorial videos for each section that will give you a quick overview of the theory before we jump in to examples. Our goal is to make things as simple as possible. We will go through MANY examples in order to ensure you understand the concept. We want to show that one concept can be tested in multiple different ways. By making your way through all the questions, you will see different variations and learn new techniques that will make MATH 1505 a breeze. We'll show you shortcuts, easy tricks to remember, and even go through past test questions.

In short, if you're reading this, you're already on the right path. Your success is our success and we wish you the best with this course.

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Please note we are unable to offer tutoring assistance over e-mail.

Domain - Square Root Functions

Finding The Domain Of Square Root Functions

In general, a number under a square root must be greater than or equal to 0.

$for\ \sqrt{f(x)}\quad domain\ is\ f(x) \geq 0$

(If you have a calculator nearby, plug in a negative number under the square root and you will get an error)

Steps:

1) Set function under the square root to be greater than or equal to 0 (≥ 0) and solve
2) Domain is solution to inequality in step 1 (write answer in interval or set notation)
    a. If it's a linear inequality, solve the inequality to get the solutions
    b. For all other types of inequalities, find the 'zeros' and use a chart

Example (VID_6428) Find the domain of the following function:

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

Example (VID_1098) Find the domain of the following function:

$g(x) = \sqrt{5x + 4}$

Example (VID_0972) Find the domain of the following function:

$h(t) = \sqrt{3 - 7t}$

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Example (VID_2318) Find the domain of the following function:

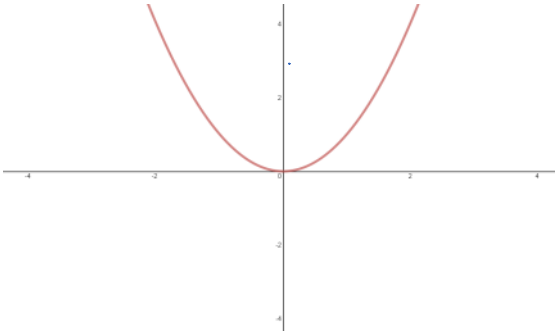
$h(x) = \sqrt{x^2 - 3x - 10}$

Example (VID_1242) Find the domain of the following function:

$f(x) = \sqrt{9 - x^2}$

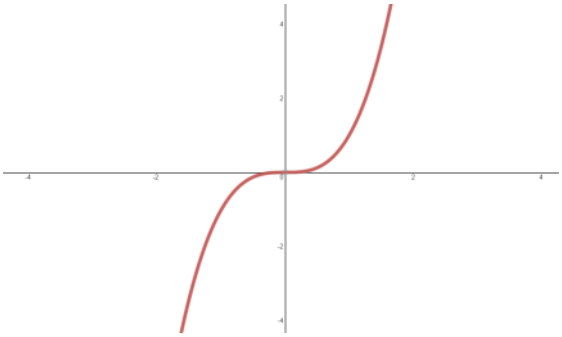
What Is Symmetry

There are 2 types of symmetry we are concerned with, odd symmetry and even symmetry. Sometimes these are referred to as odd functions or even functions.



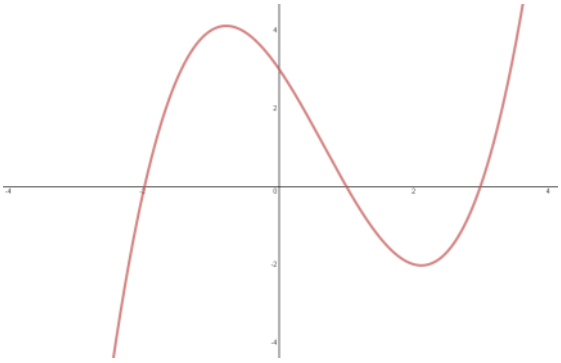
Even Symmetry
If the following is true for a function, then it shows even symmetry and it is an even function. These functions are symmetric about the y-axis

$$f(-x) = f(x)$$



Odd Symmetry
If the following is true for a function, then it is shows odd symmetry and it is an odd function. These functions are symmetric about the origin. 180* ROTATION

$$f(-x) = -f(x)$$
Or
$$-f(-x) = f(x)$$



No Symmetry

A function can have even symmetry OR odd symmetry OR no symmetry. It can't be both even and odd at the same time!

Symmetry - Equation Examples

Equation Examples

Usually, you are not given a graph to determine symmetry. Instead, you have to figure out if an equation has even/odd/no symmetry using the following formulas.

Even Symmetry	**Odd Symmetry**
$f(-x) = f(x)$	$f(-x) = -f(x)$

Steps for determining symmetry:

1) Determine your function $f(x)$
2) Find $f(-x)$ by replacing every x in $f(x)$ with $-x$
   a. Simplify and compare to $f(x)$. If it's the same, it's EVEN, otherwise go on to step 3.
3) Find $-f(x)$ by multiplying $f(x)$ by -1
   a. Simplify and compare to $f(-x)$ from step 2. If it's the same, it's ODD, otherwise go on to step 4.
4) If you made it to step 4, it means there is NO symmetry present. It is not even or odd.

Example (VID_3846) Determine if $f(x) = 3x^2 - 1$ has even, odd, or no symmetry.

Example (VID_9074) Determine if $f(x) = \frac{x}{\sqrt{x^2+1}}$ is even, odd, or neither.

Example (VID_6433) Determine if $f(x) = x^3 + 2x + 1$ is even, odd, or neither.

Composite Functions

$(f \circ g)(x) = f[g(x)]$ Read as "f of g of x"

"Plug x into g(x), and g(x) into f(x)" $x \to g(x) \to f(g(x))$

Note: x has to be in the domain of $g(x)$, and $g(x)$ has to be in the domain of $f(x)$

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Example

Given $f(x) = x^3 + 2x + 1$ and $g(x) = \sqrt{x+3}$

A) Find $(f \circ g)(x)$ **(VID_9143)**

B) Find $(f \circ f)(x)$ **(VID_1238)**

C) Find $(g \circ f)(x)$ **(VID_3030)**

D) Find $(g \circ g)(x)$ **(VID_7241)**