Functions, Limits & Derivatives

Learning Outcomes:

Identify Properties of elementary functions (formed by composition of power, exponential, logarithmic and trigonometric functions and their inverses).

Functions

Definition of a Function

A **function** f is a rule that assigns to each element x in a set D exactly one element, called $f(x)$, in a set E.

Set D is called the _____ of the function.

Set E is called the _____ of the function.

Functions

Definition of a Function

A **function** f is a rule that assigns to each element x in a set D exactly one element, called $f(x)$, in a set E.

Set D is called the domain of the function.

Set E is called the range of the function.

Your very first Flash card

$\sqrt{x^2} =$

(A) x

(B) $-x$

(C) $|x|$

(D) undefined

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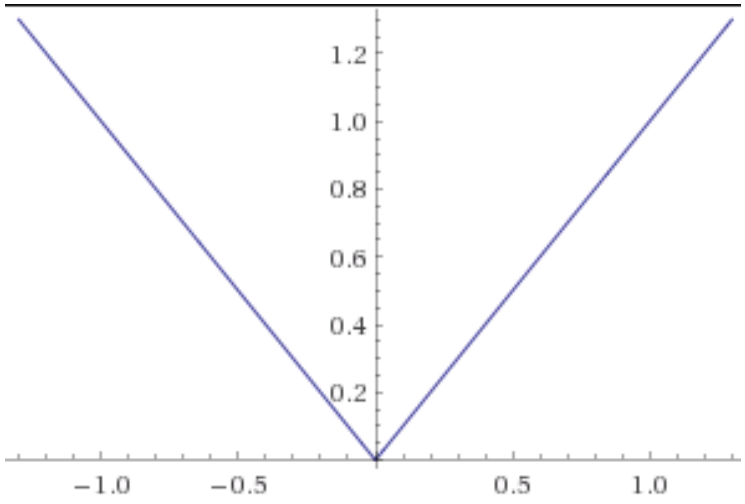

Your very first Flash card

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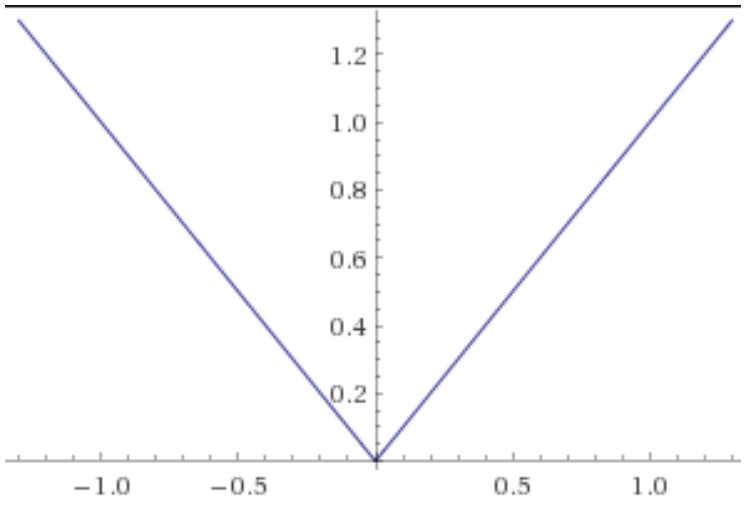
(A) x

(B) $-x$

(C) $|x|$

(D) undefined

$$\sqrt{x^2} = \begin{cases} -x, & x < 0 \\ x, & x \geq 0 \end{cases}$$



Parent Functions

You should be able to identify by name and sketch a graph of each of the following parent functions.

1. $y = x$
2. $y = |x|$
3. $y = x^2$
4. $y = x^3$
5. $y = x^b$
6. $y = \sqrt{x}$
7. $y = \sqrt[3]{x}$
8. $y = \frac{1}{x}$
9. $y = 2^x$
10. $y = e^x$
11. $y = \ln x$
12. $y = \frac{1}{1+e^{-x}}$
13. $y = \sin x$
14. $y = \cos x$
15. $y = \tan x$

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Homework: p.343 #7-21