

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.

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) $-x$

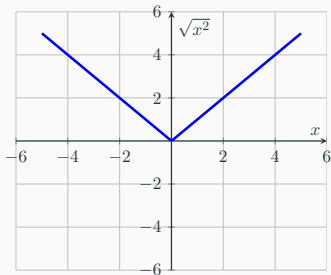
(C) $|x|$

(D) undefined

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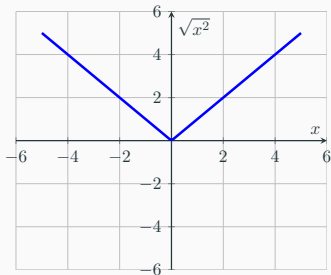


Your Very First Flash Card

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- (B) $-x$
- (C) $|x|$
- (D) undefined

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



Parent Function

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. $y = \cos x$

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Homework: p.342#7-21