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# Noteworthy Framework

*Examples & Documentation (Solutions)*

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*Written by:*

*Sihoo Lee / Lee Hojun*

*NOTEWORTHY*

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# Preface

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Welcome to the **Noteworthy Framework**. This document serves as both a demonstration of the framework's capabilities and a reference for its features.

## 1 About Noteworthy

Noteworthy is a modular framework for creating beautiful educational documents in Typst. It provides a comprehensive set of tools for:

- **Structured Layouts:** Automated chapters, sections, and covers.
- **Themed Components:** Pre-styled blocks for definitions, theorems, examples, and more.
- **Advanced Plotting:** Integrated 2D and 3D plotting capabilities.
- **Customizable Themes:** A robust theming engine with multiple built-in presets.

## 2 Using This Guide

Each section of this document demonstrates a specific module of the framework. You can find the source code for these examples in the `content/` directory, which serves as a practical reference for your own documents.

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*Sihoo Lee & Lee Hojun  
Noteworthy*

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## Chapter 01

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# Core Components

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*This chapter demonstrates the fundamental building blocks of the Noteworthy framework, including text blocks, layouts, and basic document structure.*

# Chapter 01.01

# *Content Blocks*

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## 1 Content Blocks

Noteworthy provides a variety of semantic blocks to structure your educational content.

### 1.1 Definitions & Theorems

#### DEFINITION | Vector

A **vector** is a quantity that has both magnitude and direction. It is often represented by an arrow.

#### THEOREM | Pythagorean Theorem

In a right-angled triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides:

$$a^2 + b^2 = c^2$$

### 1.2 Proofs & Solutions

#### Proof |

Let  $a, b$  be the lengths of the legs and  $c$  be the length of the hypotenuse. Construct a square of side  $a + b$ ... ∴ The area relationships confirm the theorem.

#### EXAMPLE | Finding the Hypotenuse

Given a right triangle with legs of length 3 and 4, find the length of the hypotenuse.

#### Solution 1 |

Using the Pythagorean theorem:

$$c = \sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5$$

## 1.3 Notes & Remarks

### NOTE | Important

Always remember to check the units when solving physics problems using vectors.

### NOTATION | Vector Notation

Vectors are typically denoted by boldface letters ( $\mathbf{v}$ ) or arrows ( $\vec{v}$ ).

### ANALYSIS | Geometric Interpretation

Geometrically, vectors can be added using the parallelogram rule or the triangle rule.

# Chapter 01.02

# *Layout Elements*

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## 1 Layout Elements

This section demonstrates various layout utilities available in Noteworthy.

### 1.1 Equations

#### EQUATION | Maxwell's Equations

$$\nabla \cdot (E) = \frac{\rho}{\varepsilon_0}$$
$$\nabla \cdot (B) = 0$$
$$\nabla \times (E) = -\partial \frac{(B)}{\partial t}$$
$$\nabla \times (B) = \mu_0(J) + \mu_0 \varepsilon_0 \partial \frac{(E)}{\partial t} t$$

### 1.2 Conditional Content

Noteworthy supports conditional rendering based on the `show-solution` configuration.

#### NOTE | Instructor's Note

This content is only visible when `show-solution` is set to `true` in `config.typ`.

### 1.3 Custom Snippets

You can define custom math snippets in `config.typ` for faster typing.

such that  
without loss of generality  
 $\therefore$  Q.E.D.

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## Chapter 02

# Plotting & Geometry

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*Explore the powerful plotting capabilities of Noteworthy, from basic 2D graphs to complex geometric constructions and vector diagrams.*

## Chapter 02.01

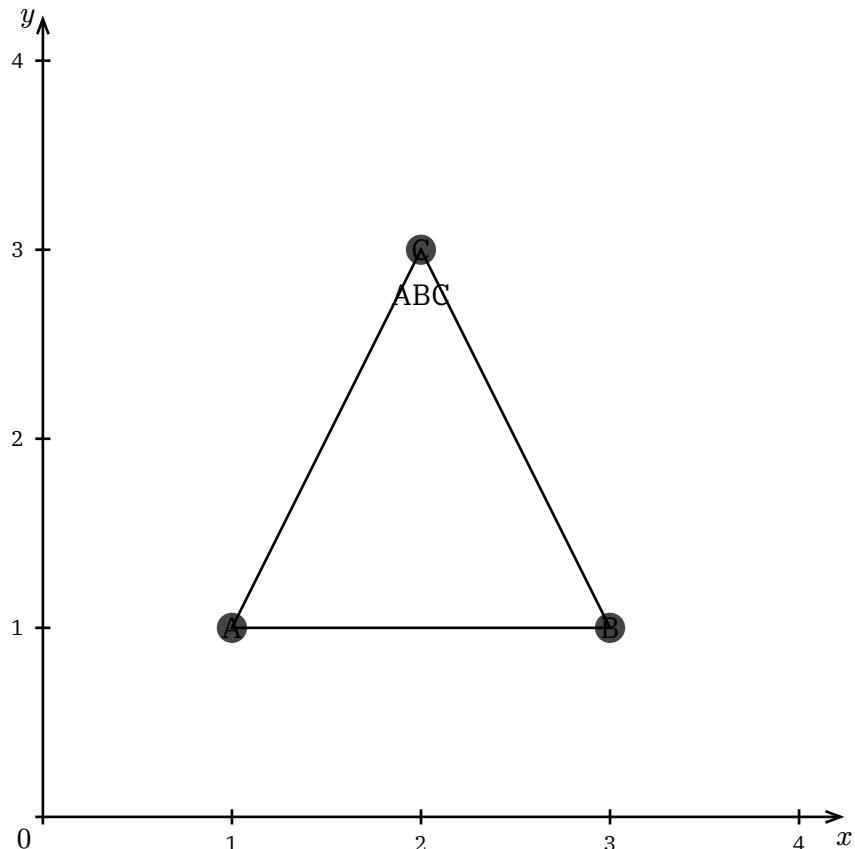
# ***Geometry (Geoplot)***

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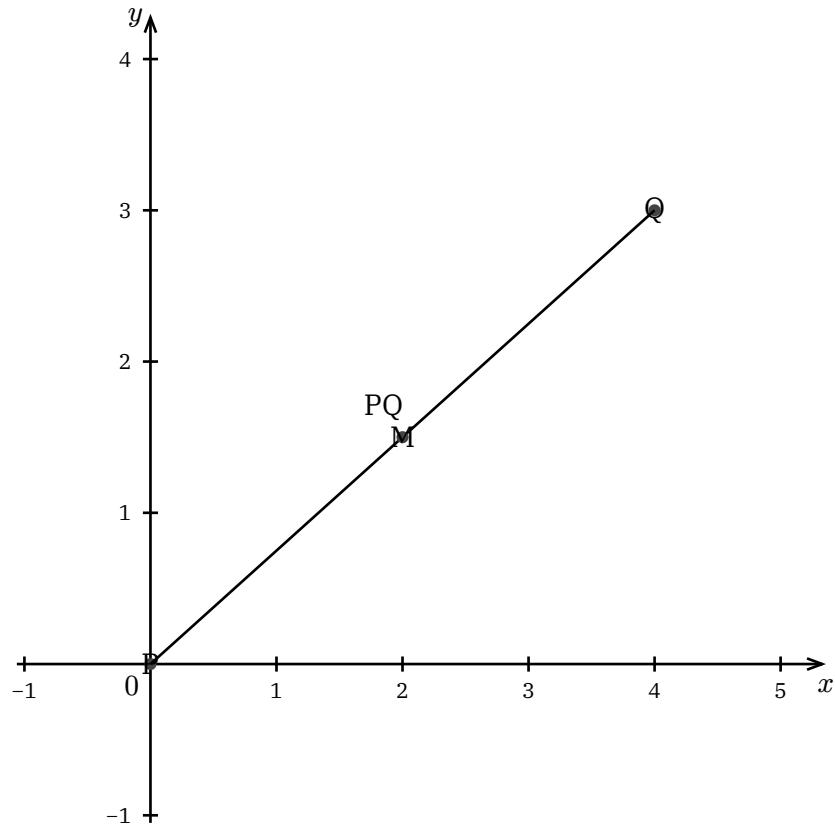
### **1 Geometry (Geoplot)**

The geometry module provides a unified object-oriented system for constructing Euclidean geometry, with intelligent labeling and comprehensive style support.

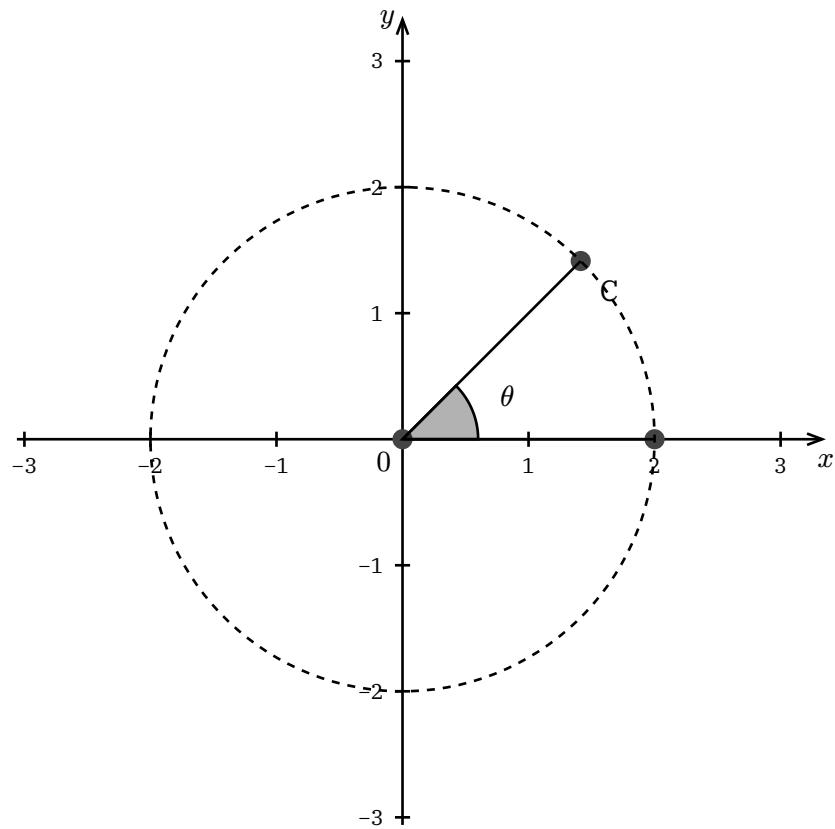
#### **1.1 Points & Triangles**



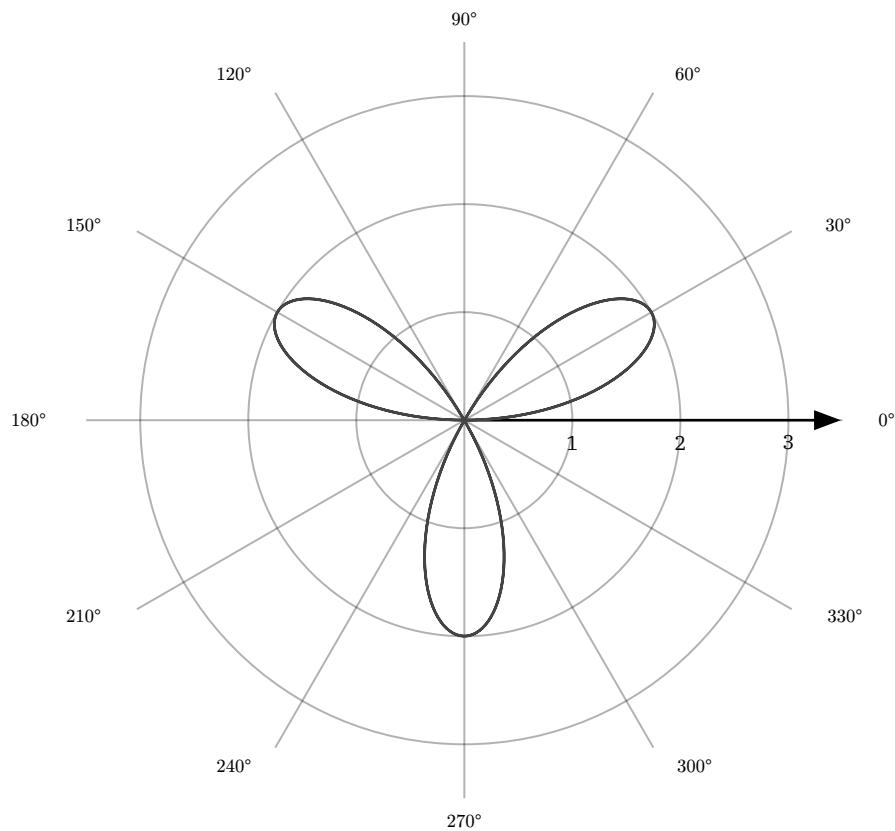
## 1.2 Lines & Segments



## 1.3 Angles & Circles



## 1.4 Polar Plots



## Chapter 02.02

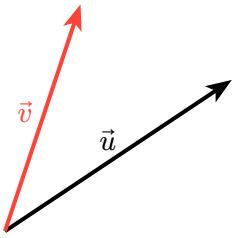
# Vectors (*Vectorplot*)

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### 1 Vectors (Geoplot)

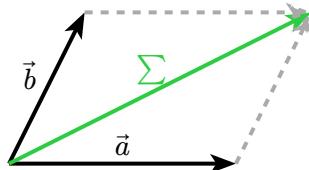
Visualize vectors using the unified object system.

#### 1.1 Vector Objects



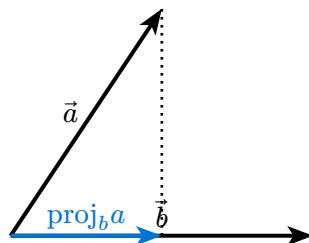
#### 1.2 Vector Addition

Demonstrating the parallelogram method using object composition:



#### 1.3 Vector Projection

Visualizing projection of  $a$  onto  $b$ .



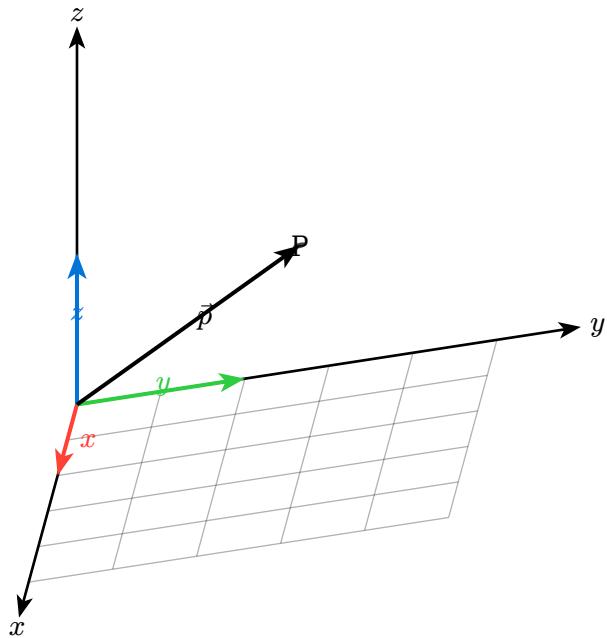
## Chapter 02.03

# 3D Space (*Spaceplot*)

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### 1 3D Space (*Spaceplot*)

Render 3D scenes with correct perspective using space- canvas.



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## Chapter 03

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# Data & Visualization

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*Learn how to visualize data and mathematical concepts using the Grapher, Combiplot, and Tableplot modules.*

## Chapter 03.01

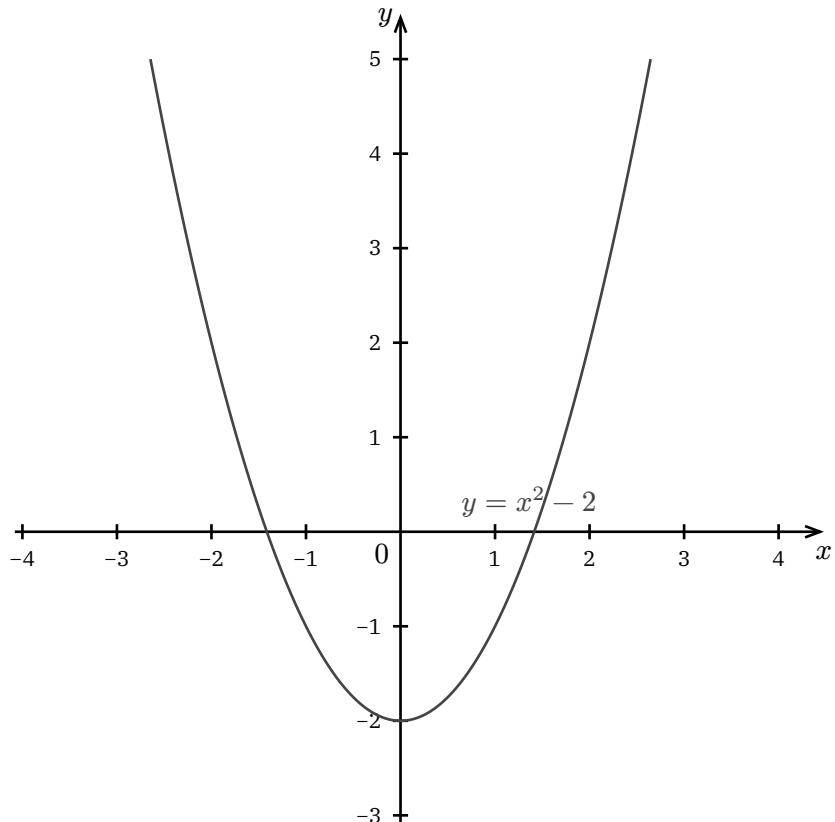
# Function Graphs

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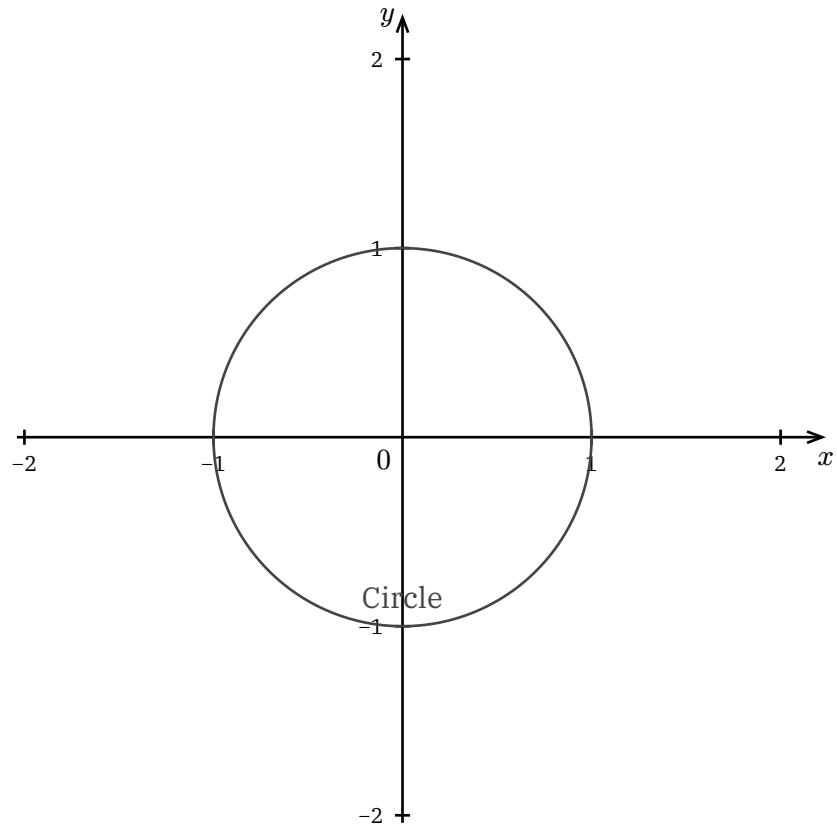
### 1 Function Graphs

Plot mathematical functions easily with the new geometry system.

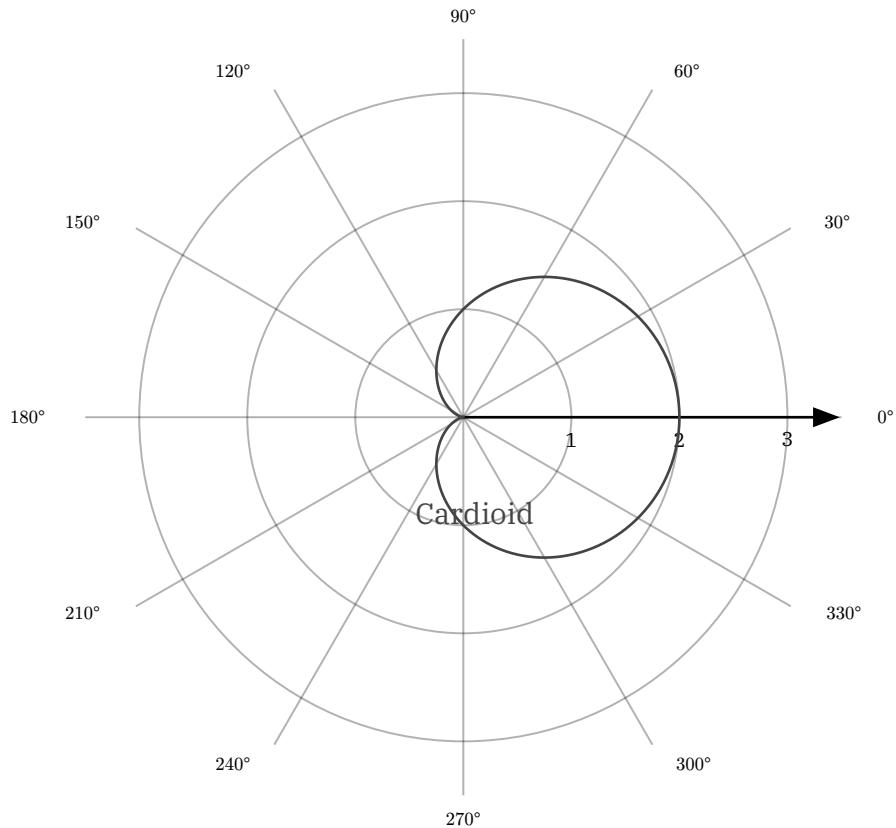
#### 1.1 Cartesian Functions



## 1.2 Parametric Functions (Circle)



## 1.3 Polar Functions (Cardioid)



## Chapter 03.02

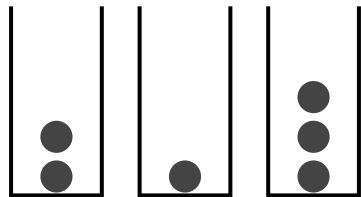
# Combinatorics

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### 1 Combinatorics

Visualizations for counting problems.

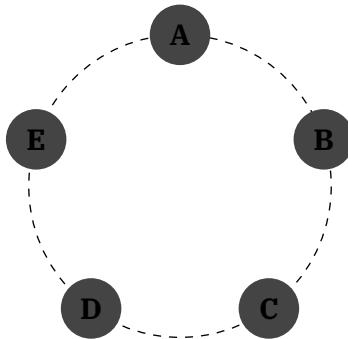
#### 1.1 Stars and Bars (Boxes)



#### 1.2 Linear Arrangements



#### 1.3 Circular Arrangements



# Chapter 03.03

# Tables

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## 1 Tables

Themed tables for data presentation.

### 1.1 Standard Table

Name	Role	Level
Alice	Engineer	Senior
Bob	Designer	Mid
Charlie	Manager	Lead

### 1.2 Compact Table

ID	Status
001	OK
002	Fail
003	OK

### 1.3 Value Table (Function Values)

$x$	$f(x)$
1	2
2	4
3	8

### 1.4 Grid Table

100	120
110	130

## Chapter 03.04

# *Calculus Visualization*

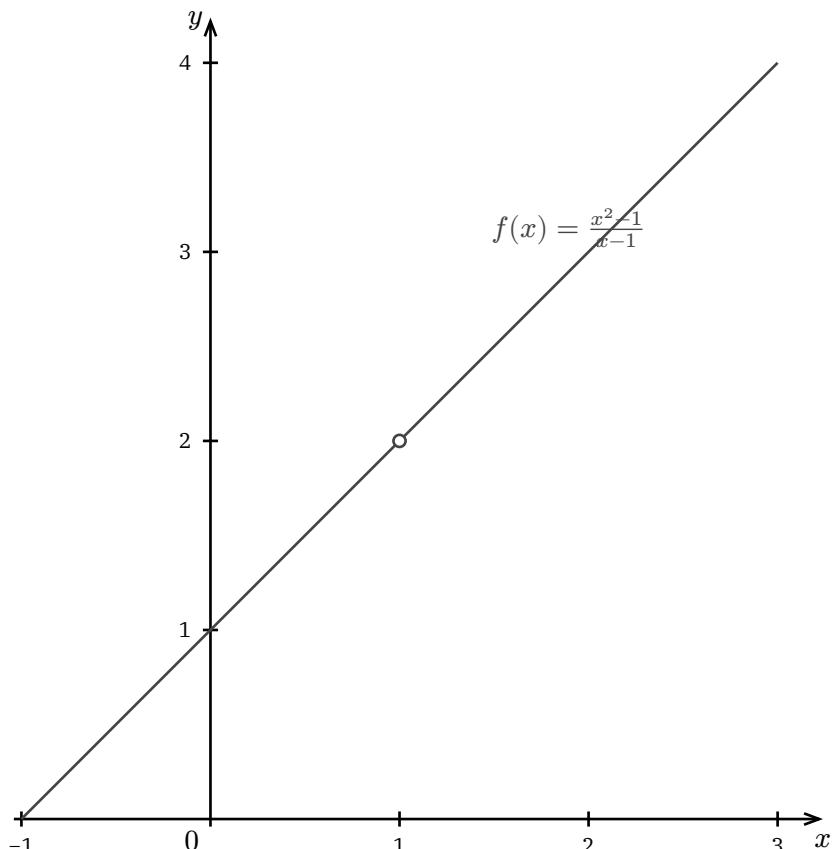
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## 1 Calculus Visualization

Tools for visualizing limits, derivatives, and integrals.

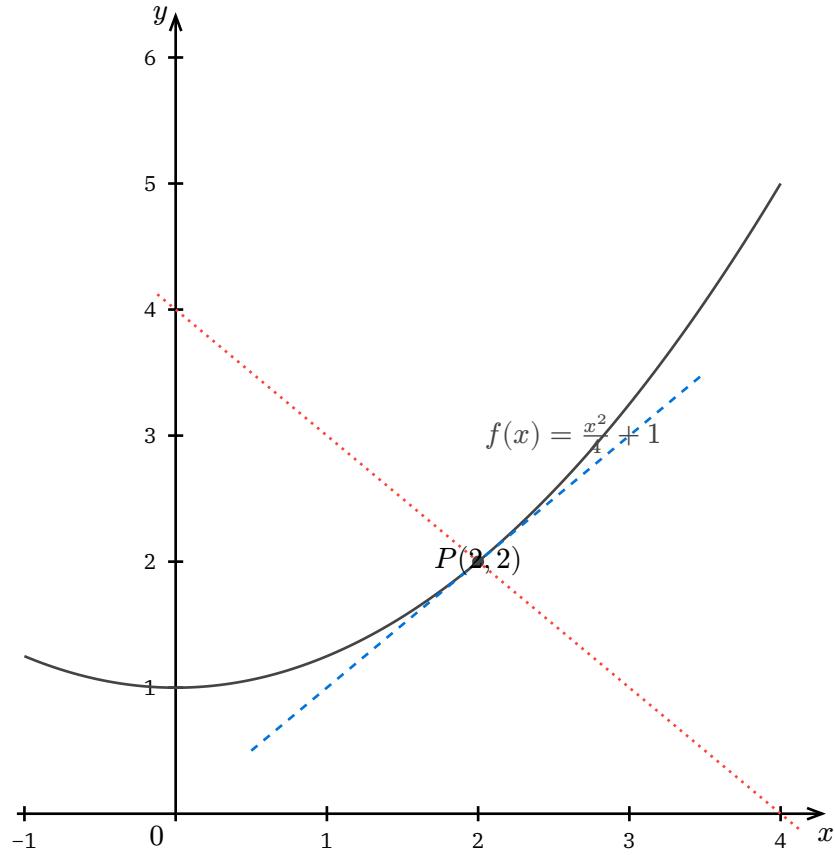
### 1.1 Limits and Holes

Visualize discontinuities using the `hole` parameter.



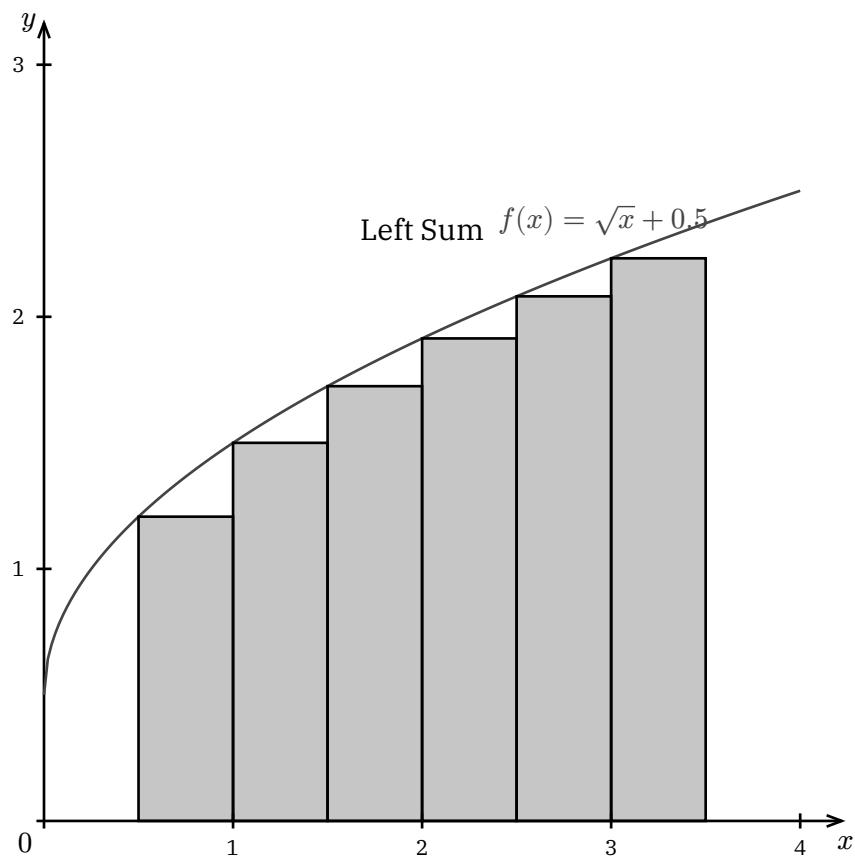
### 1.2 Derivatives (Tangents & Normals)

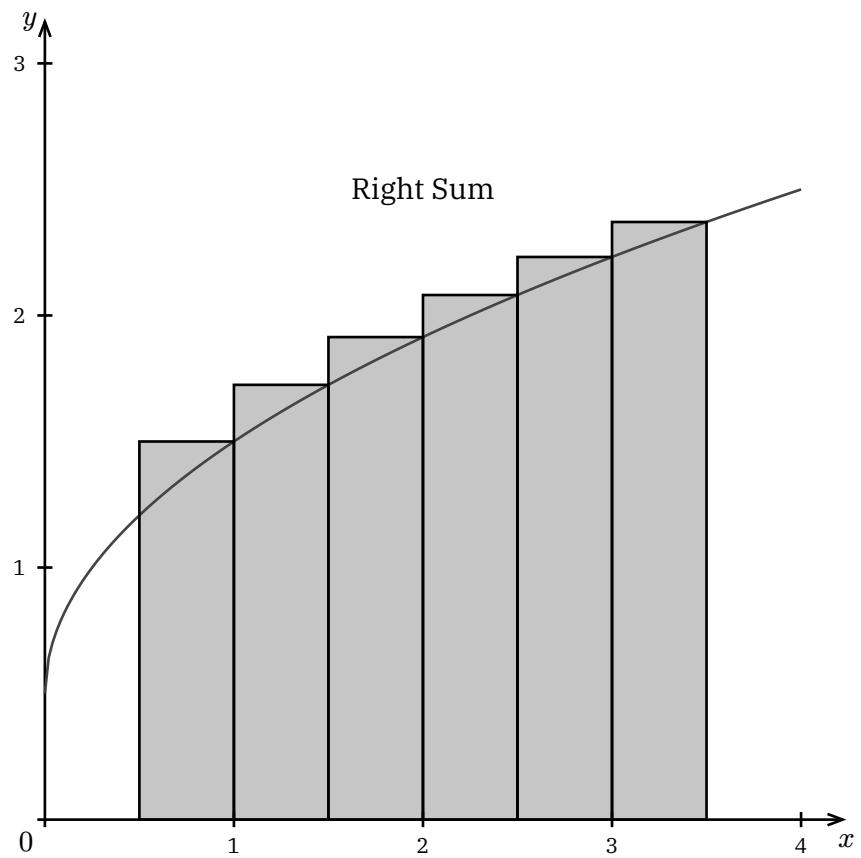
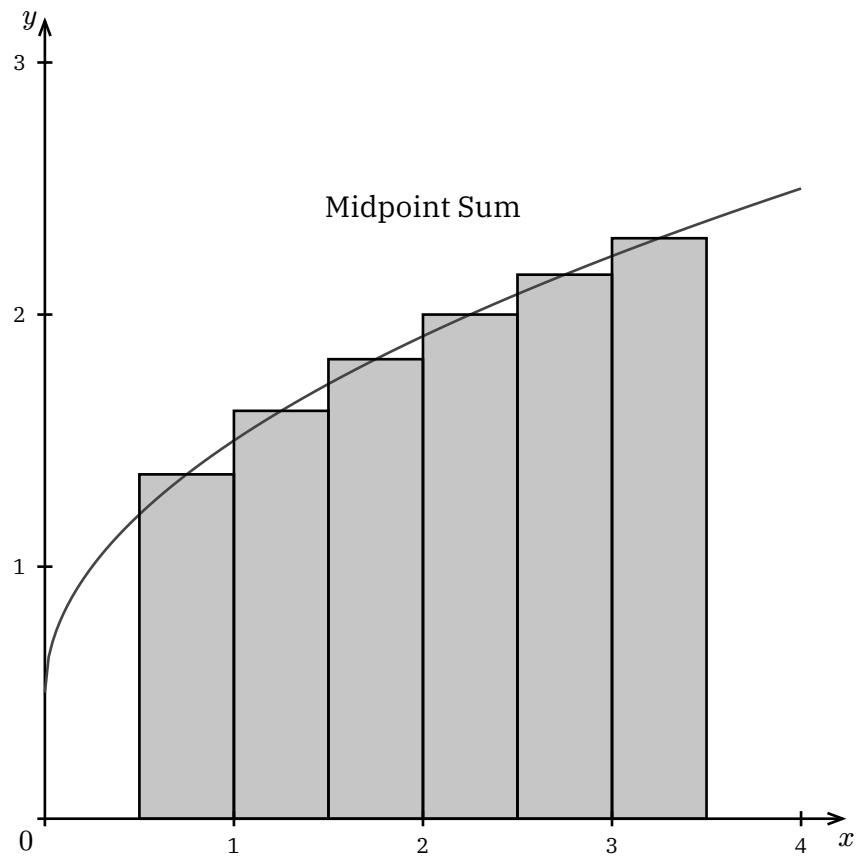
Visualize instantaneous rates of change.

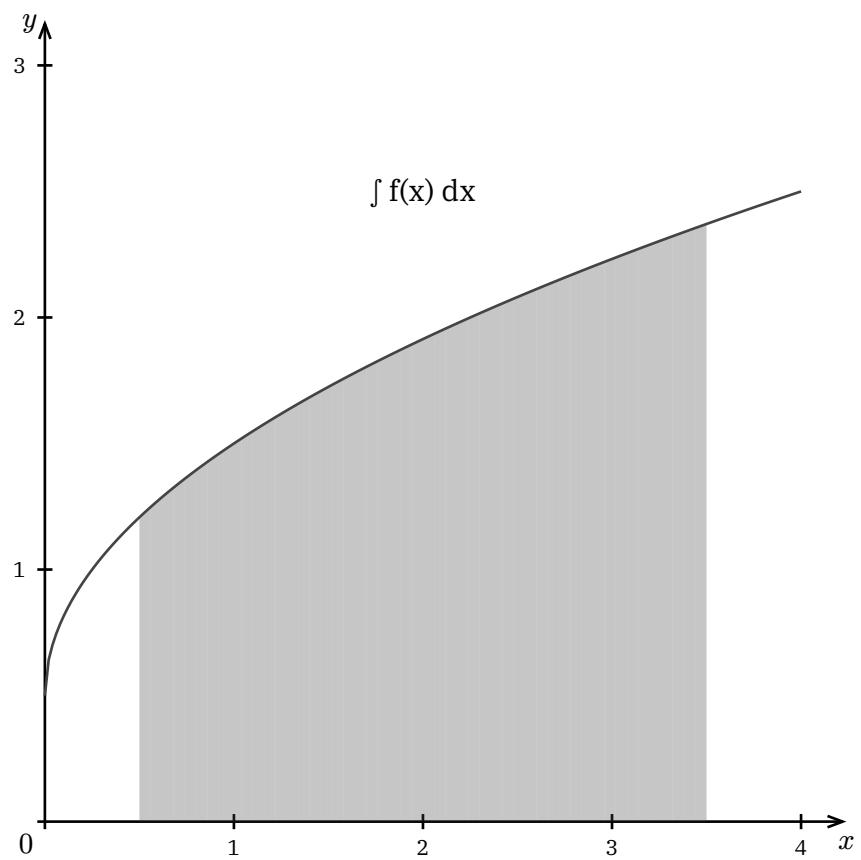
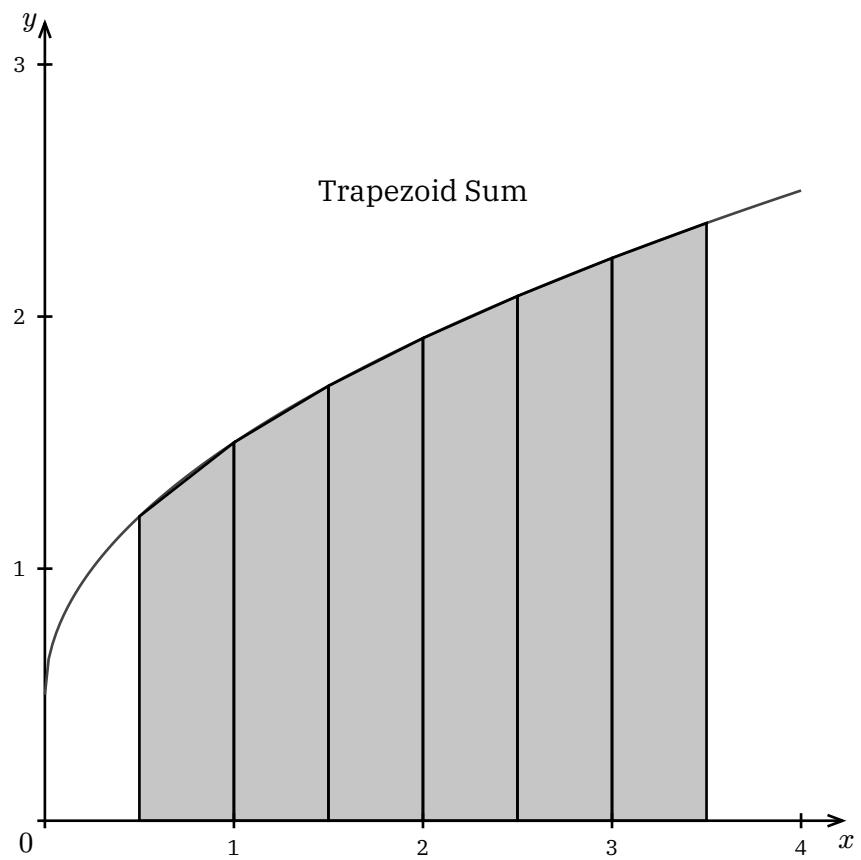


### 1.3 Integrals (Riemann Sums)

Visualize area approximation using Riemann sums.







# Chapter 03.05

# *Data Plotting*

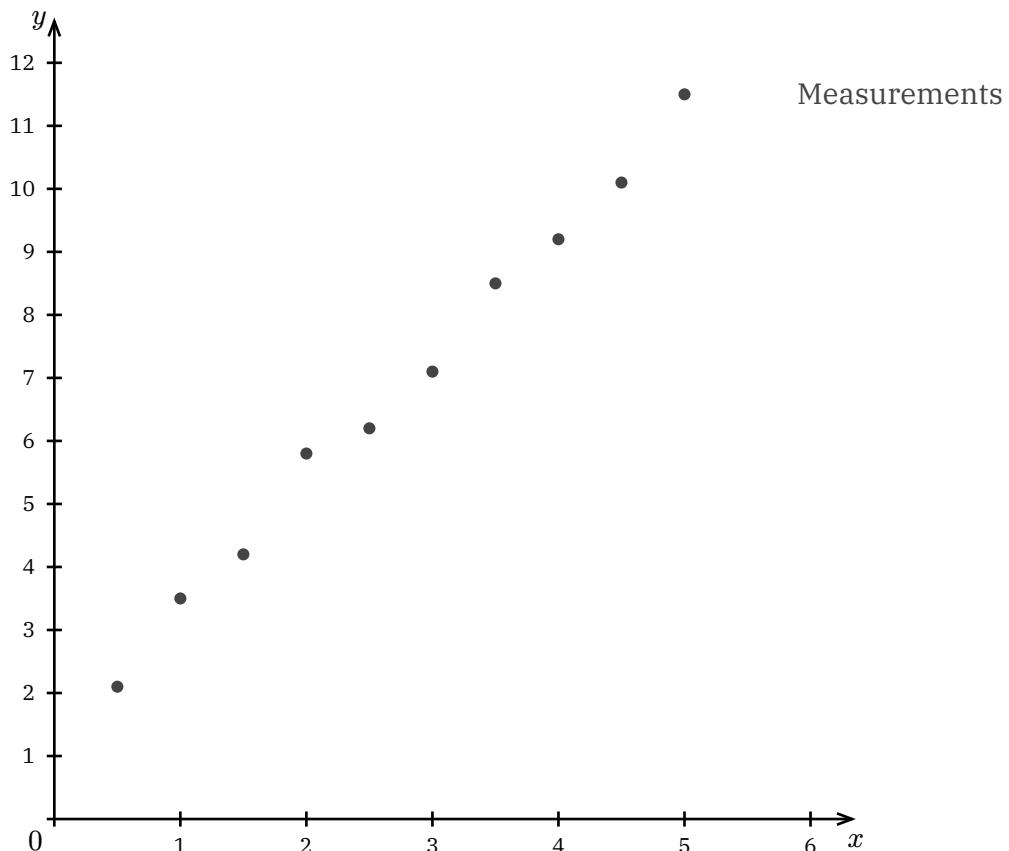
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## 1 Data Plotting

Plot data from CSV files or arrays using scatter plots and line plots.

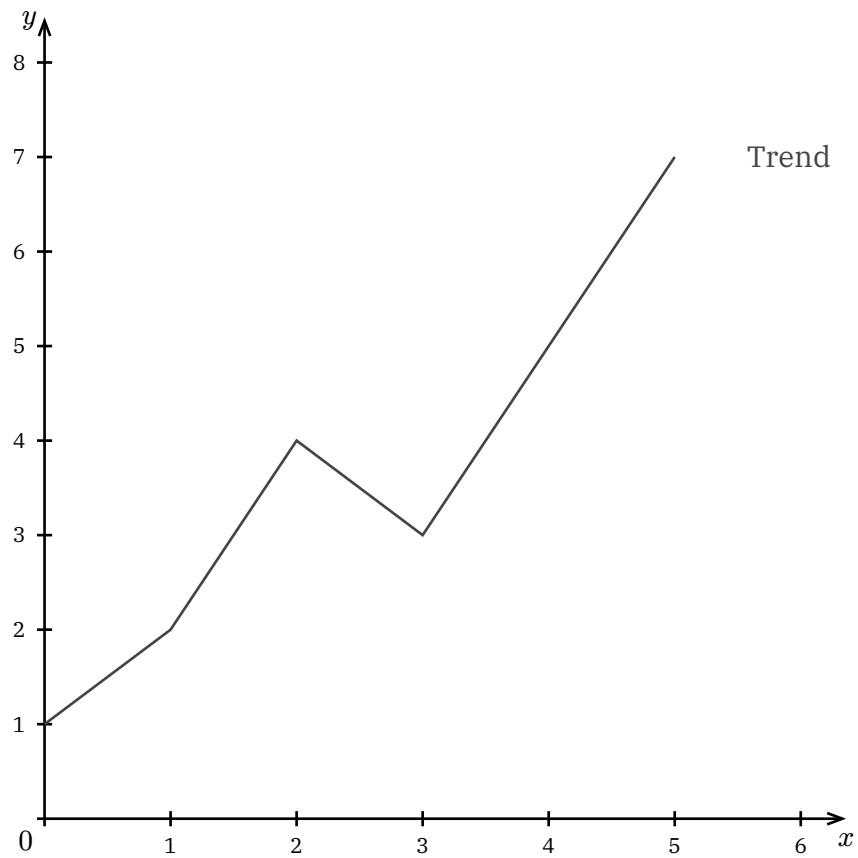
### 1.1 Scatter Plot from CSV

Load data directly from a CSV file and display as a scatter plot.



### 1.2 Line Plot from Array

Create a line plot from inline data.



### 1.3 Combined Scatter + Line

Show both points and connecting lines.

