Noteworthy Framework

Examples & *Documentation* (*Solutions*)

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NOTEWORTHY

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Preface

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.

Sihoo Lee & *Lee Hojun*
Noteworthy

Table of Contents

Chapter 01 *Core Components*

Chapter 02 *Plotting & Geometry*

Chapter 03 *Data & Visualization*

Chapter 01

Core Components

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

Chapter 01.01

Content Blocks

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 $a + b$... $\therefore$ 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 ($\boldsymbol{v}$) 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

1 Layout Elements

This section demonstrates various layout utilities available in Noteworthy.

1.1 Equations

Equation | Maxwell's Equations

$$\nabla \cdot (E) = \frac{\rho}{\varepsilon_0}$$

$$\nabla \cdot (B) = 0$$

$$\nabla \times (E) = -\partial \frac{(B)}{\partial} t$$

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

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.

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

Chapter 02

Plotting & Geometry

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

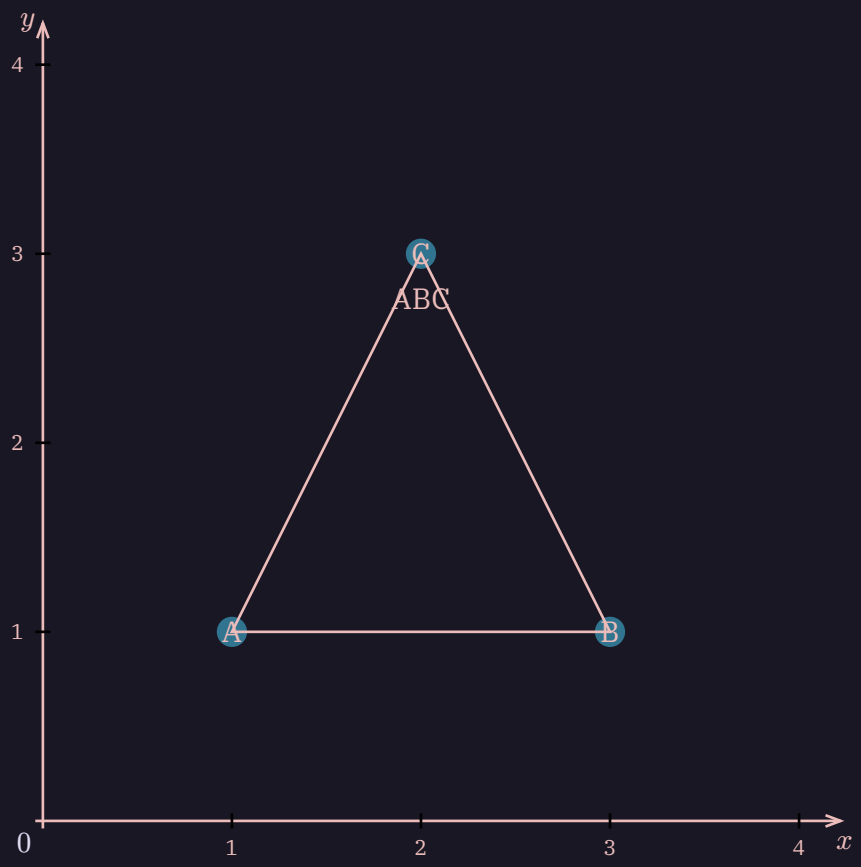
Chapter 02.01

Geometry (Geoplot)

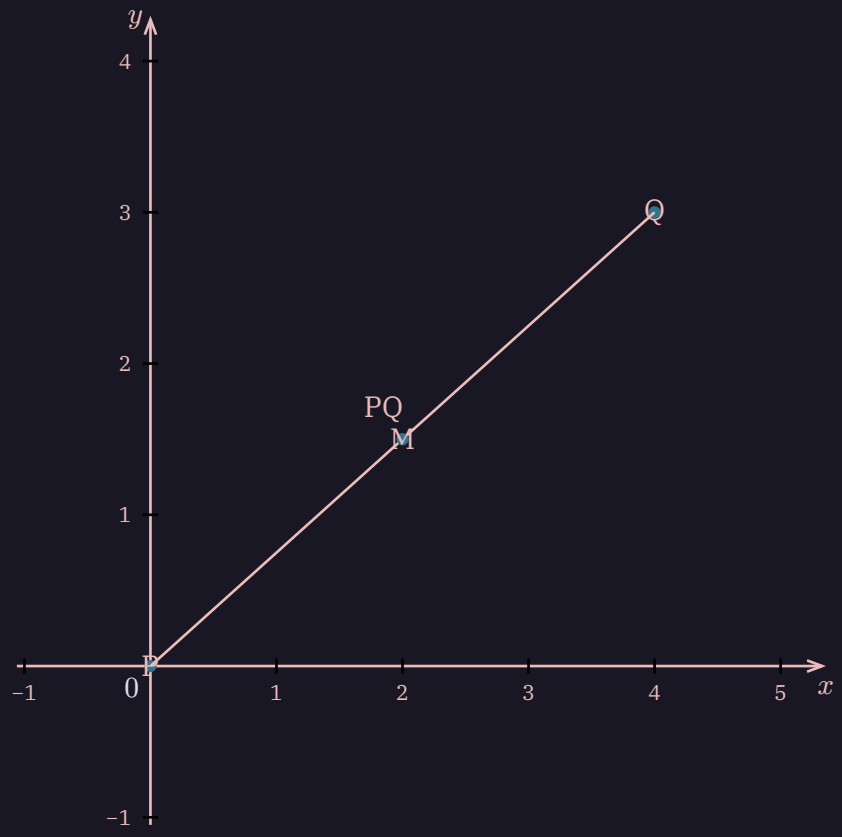
1 Geometry (Geoplot)

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

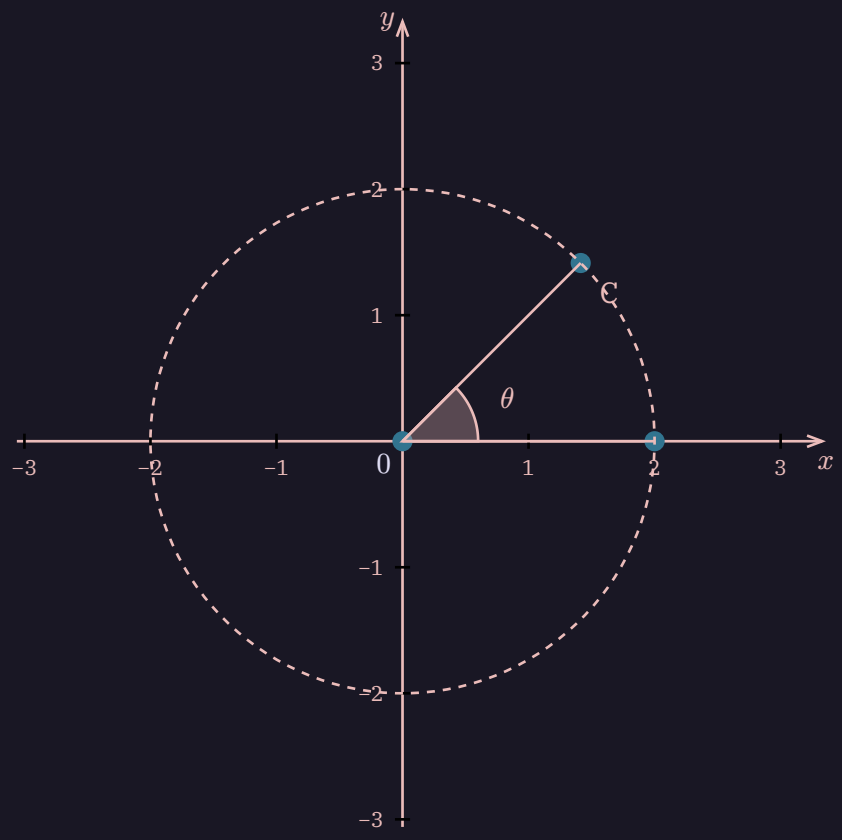
1.1 Points & Triangles



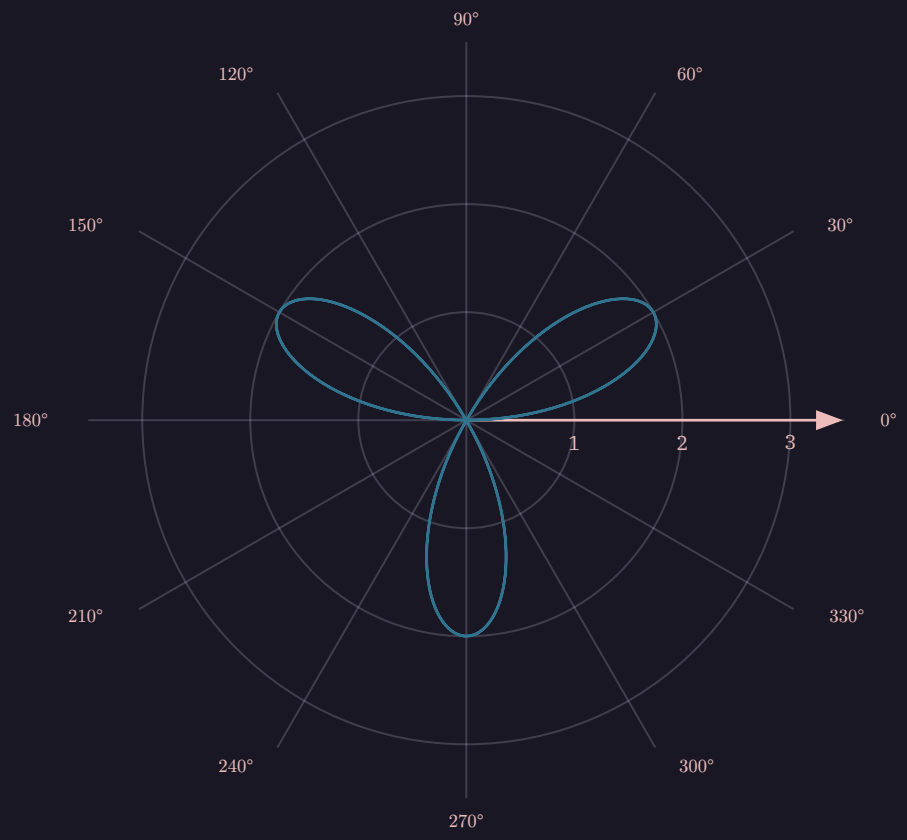
1.2 Lines & Segments



1.3 Angles & Circles



1.4 Polar Plots



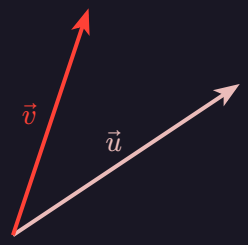
Chapter 02.02

Vectors (Vectorplot)

1 Vectors (Geoplot)

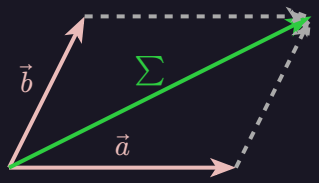
Visualize vectors using the unified object system.

1.1 Vector Objects



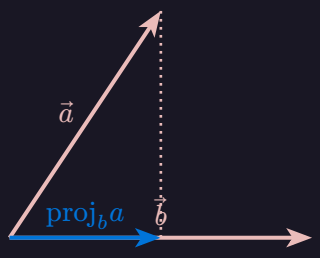
1.2 Vector Addition

Demonstrating the parallelogram method using object composition:



1.3 Vector Projection

Visualizing projection of a onto b.

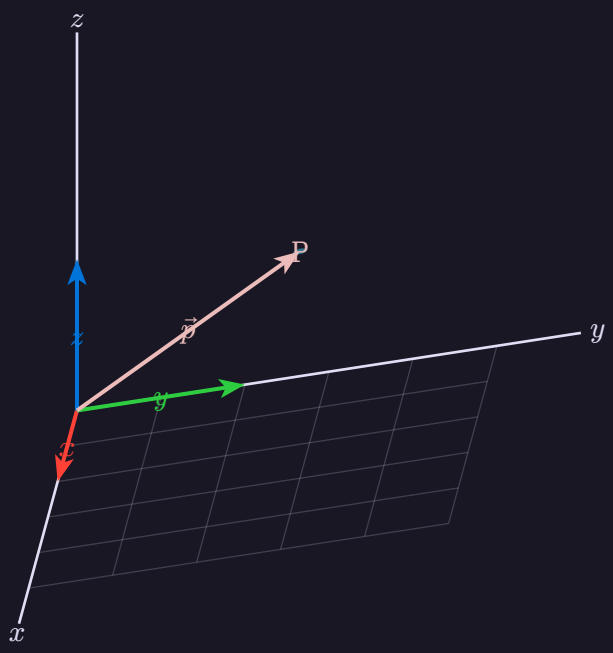


Chapter 02.03

3D Space (Spaceplot)

1 3D Space (Spaceplot)

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



Chapter 03

Data & Visualization

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

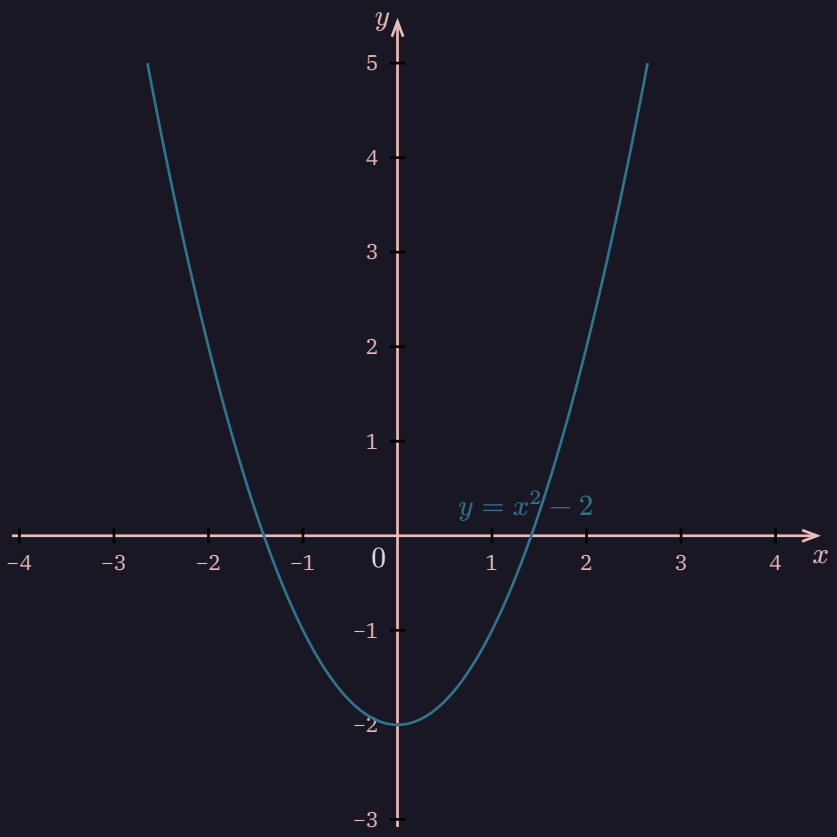
Chapter 03.01

Function Graphs

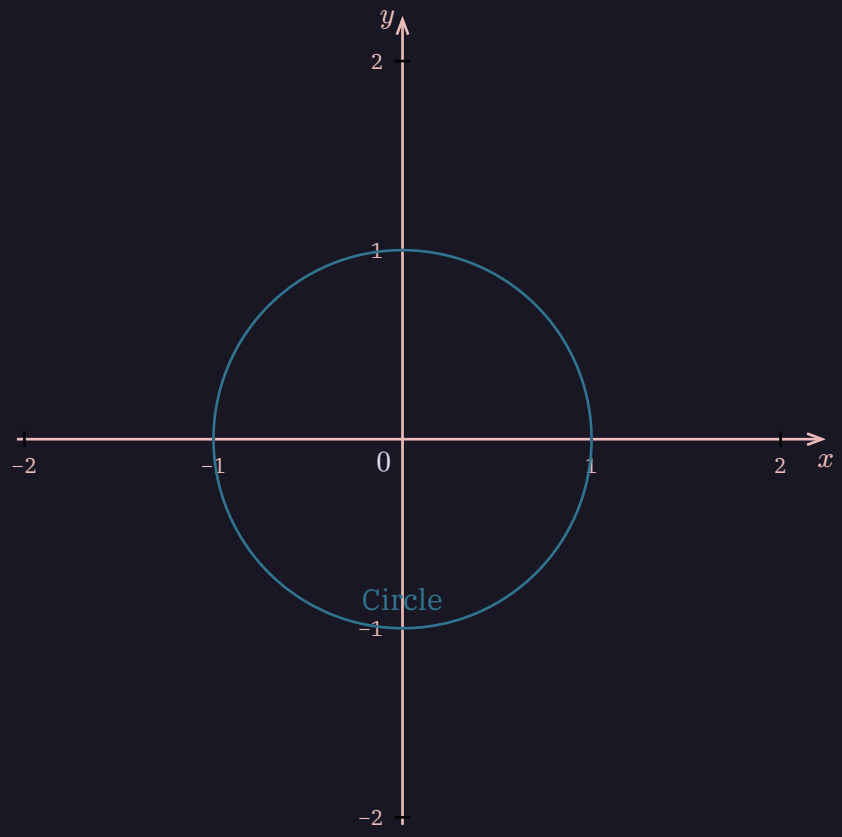
1 Function Graphs

Plot mathematical functions easily with the new geometry system.

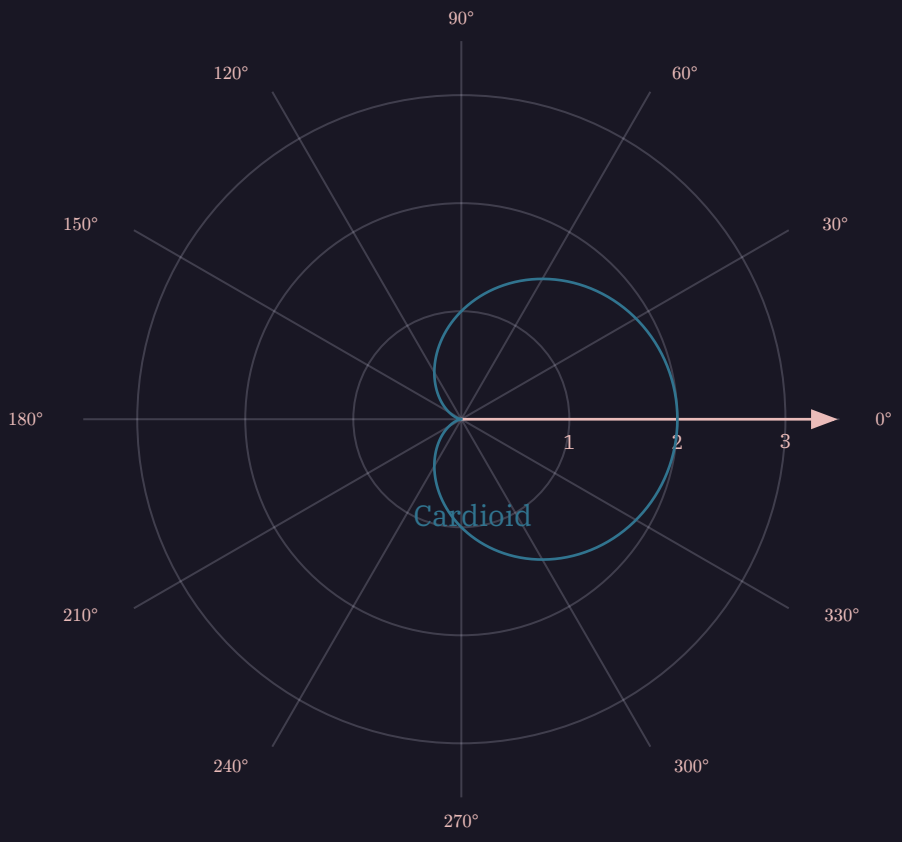
1.1 Cartesian Functions



1.2 Parametric Functions (Circle)

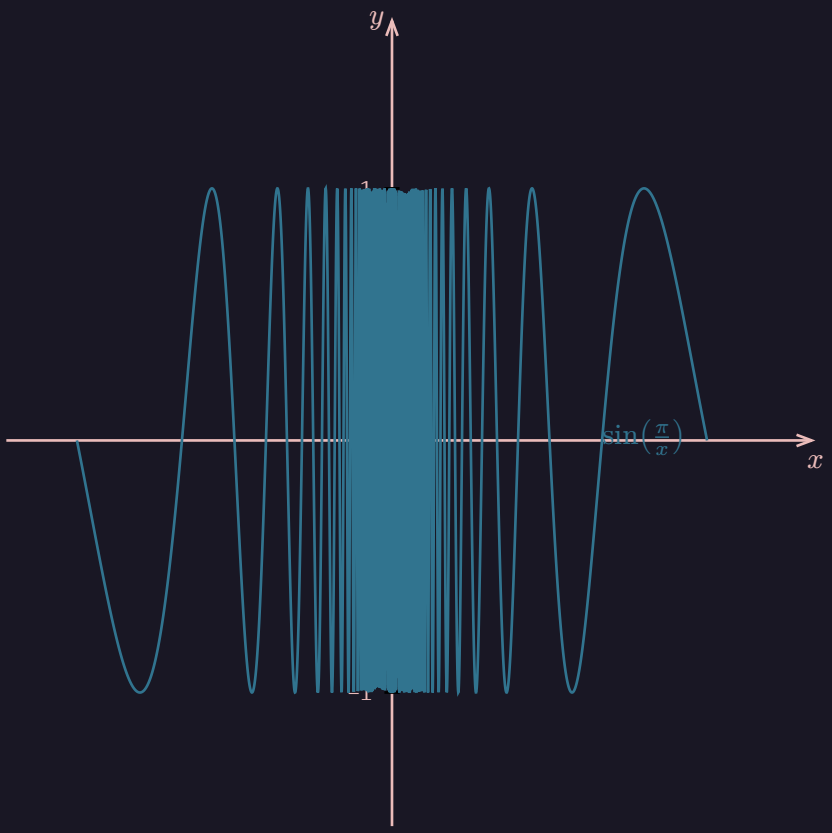


1.3 Polar Functions (Cardioid)



1.4 Robust Rendering (Singularity Handling)

The `robust-func` uses adaptive sampling to correctly render functions like $\sin\left(\frac{\pi}{x}\right)$ near singularities:



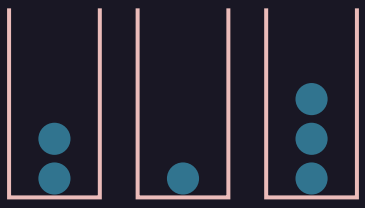
Chapter 03.02

Combinatorics

1 Combinatorics

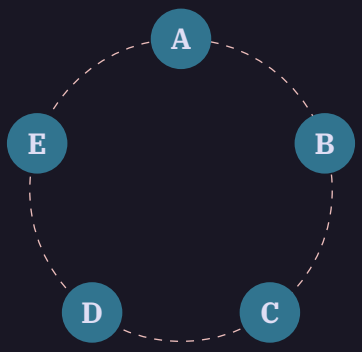
Visualizations for counting problems.

1.1 Stars and Bars (Boxes)



1.2 Linear Arrangements

1.3 Circular Arrangements



Chapter 03.03

Tables

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

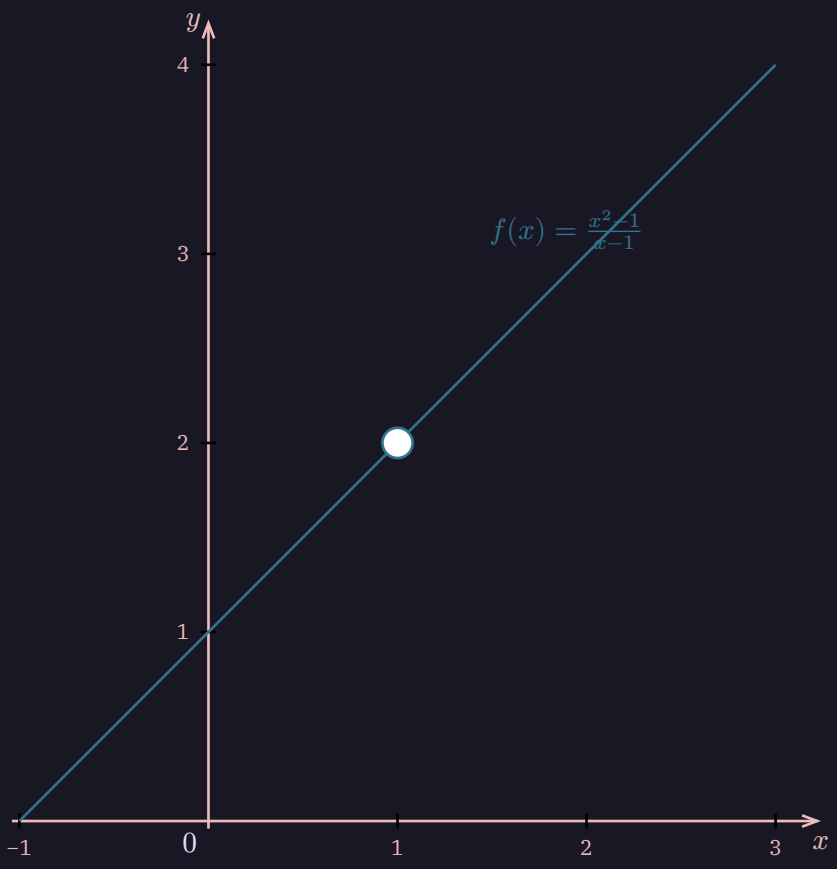
Calculus Visualization

1 Calculus Visualization

Tools for visualizing limits, derivatives, and integrals.

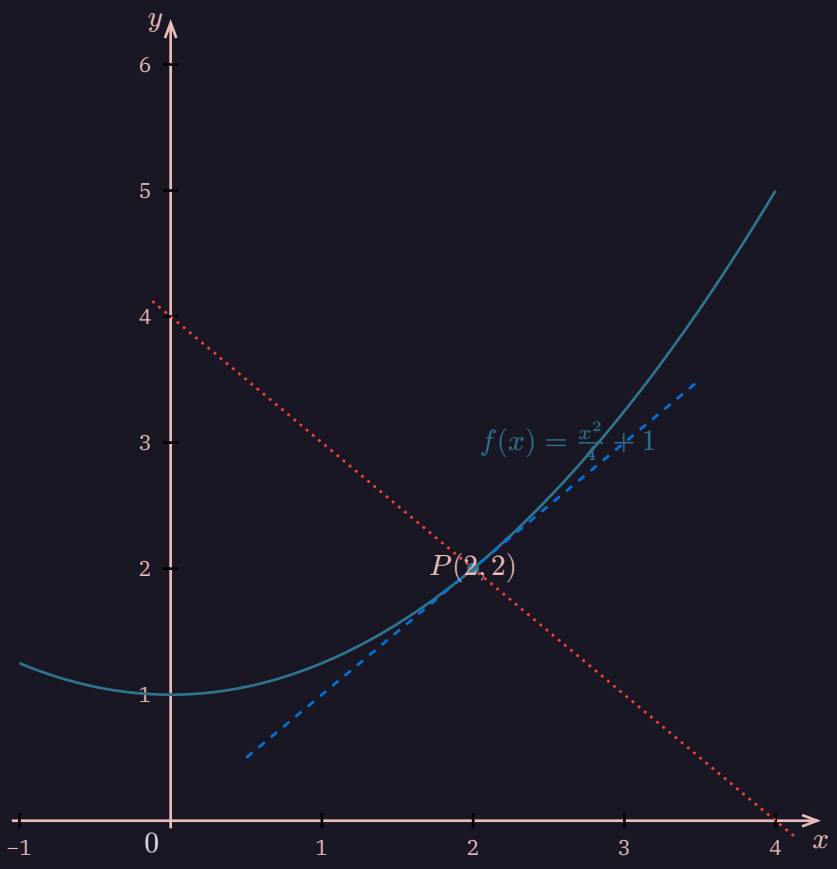
1.1 Limits and Holes

Visualize discontinuities using the `hole` parameter.



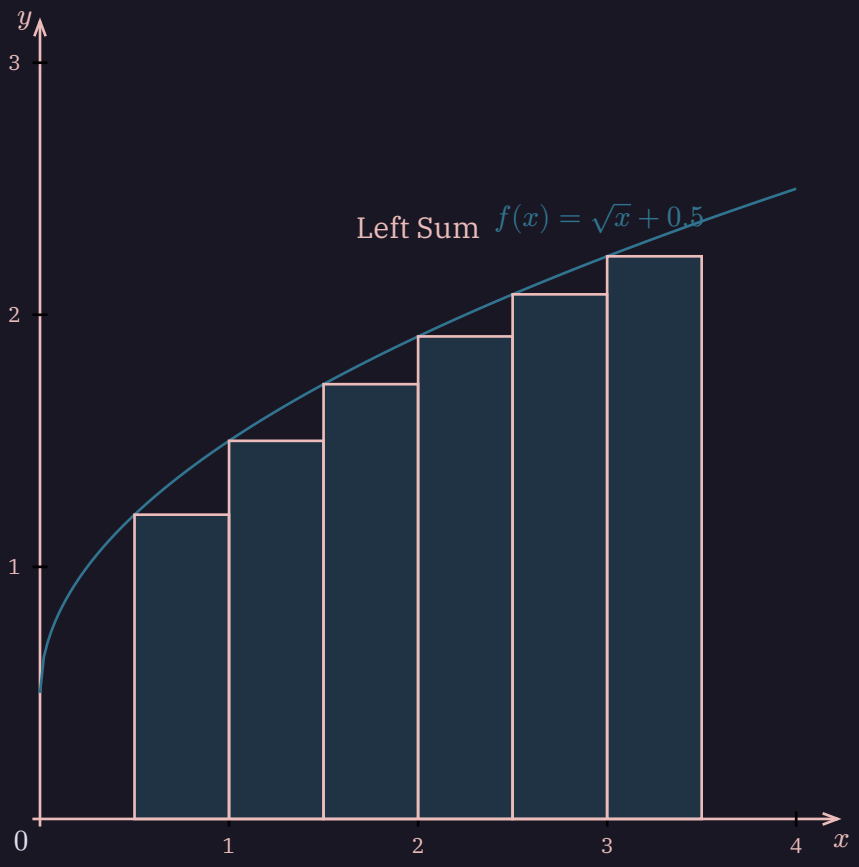
1.2 Derivatives (Tangents & Normals)

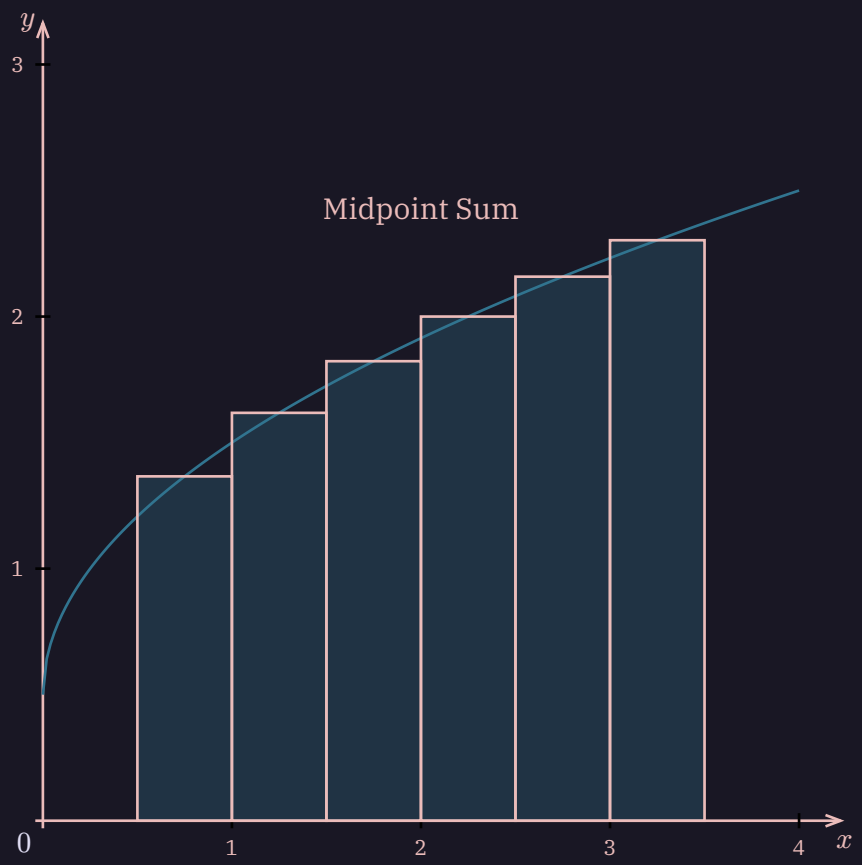
Visualize instantaneous rates of change.

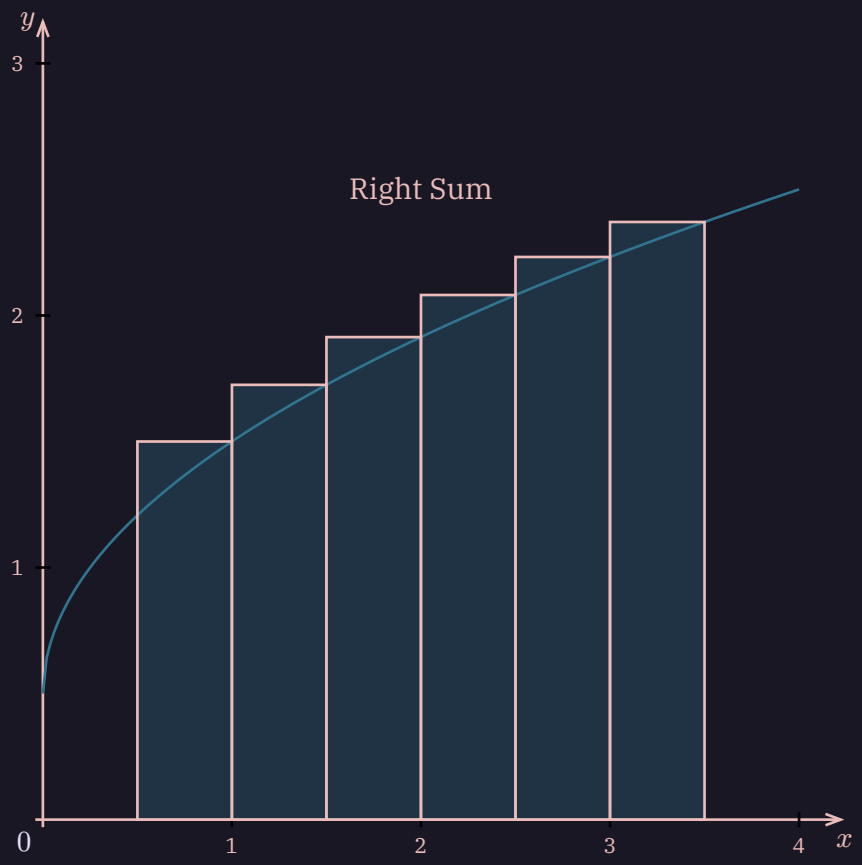


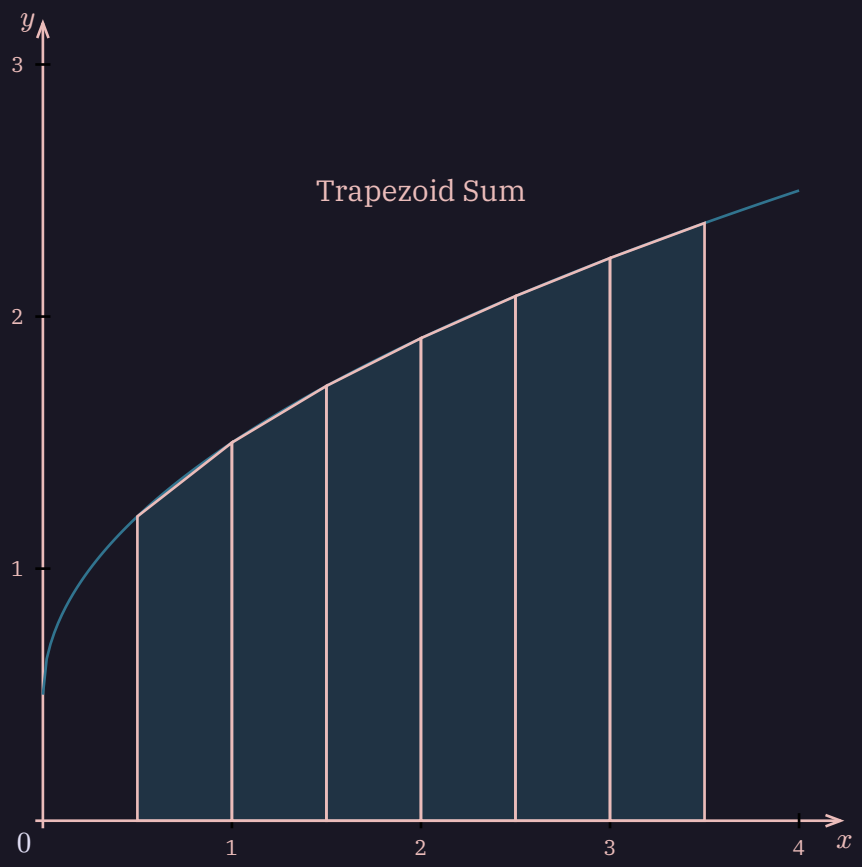
1.3 Integrals (Riemann Sums)

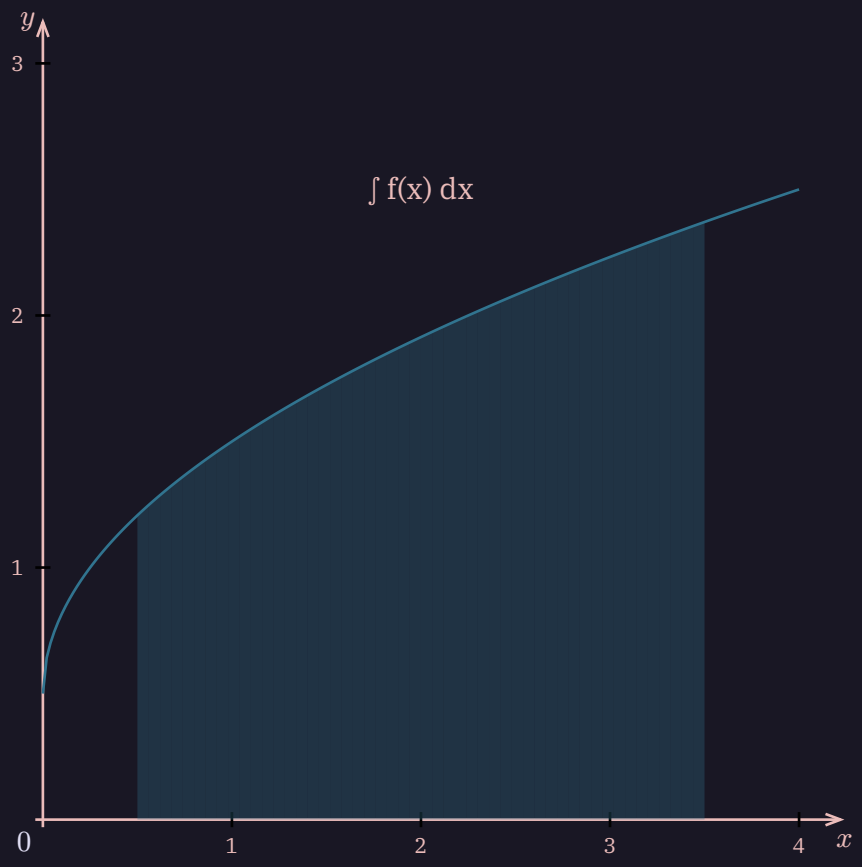
Visualize area approximation using Riemann sums.




Midpoint Sum
y
x
0
1
2
3
4


Right Sum
y
x
0
1
2
3
4


Trapezoid Sum
y
x
0
1
2
3
4


∫ f(x) dx
y
x
0
1
2
3
4