# Noteworthy Framework

*Examples* & *Documentation* (*Solutions*)

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*NOTEWORTHY*

# Preface

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

## 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.

## 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

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

# Chapter 01.01
# *Content Blocks*

## Content Blocks

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

## 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:

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

## 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:

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

## 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 ($v$) or arrows ($\vec{v}$).

### ANALYSIS | Geometric Interpretation

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

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

# *Layout Elements*

## Layout Elements

This section demonstrates various layout utilities available in Noteworthy.

## Equations

> **EQUATION | Maxwell's Equations**
>
> $$\nabla \cdot (E) = \frac{\rho}{\varepsilon_0}$$
>
> $$\nabla \cdot (B) = 0$$
>
> $$\nabla \times (E) = -\partial \frac{(B)}{\partial} t$$
>
> $$\nabla \times (B) = \mu_0 (J) + \mu_0 \varepsilon_0 \partial \frac{(E)}{\partial} t$$

## 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`.

## Custom Snippets

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

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

# Plotting & Geometry

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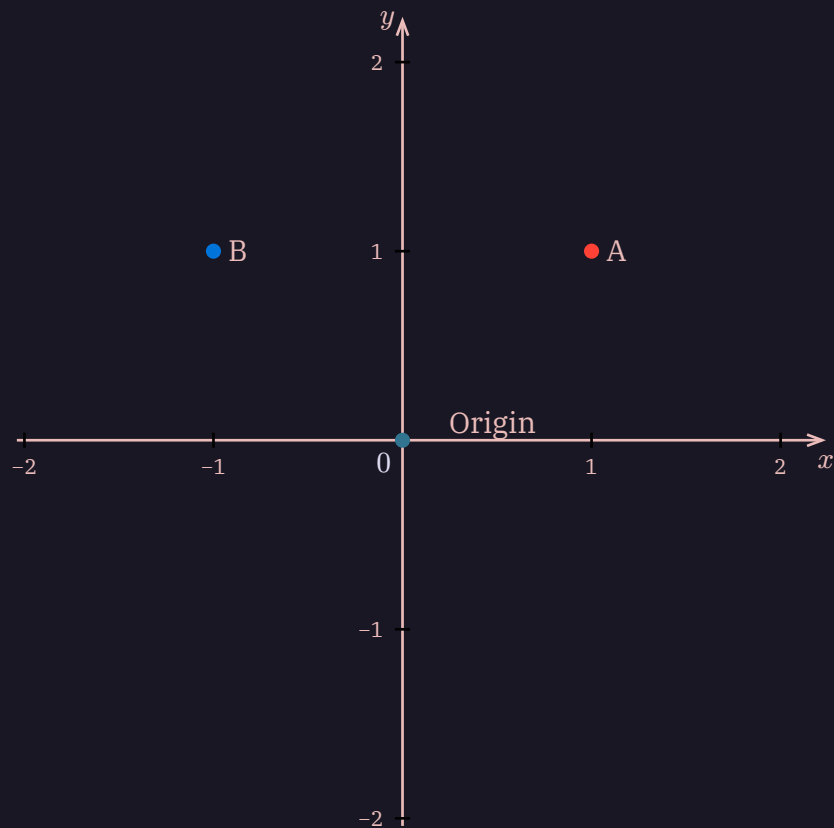
# *Basic Plots*

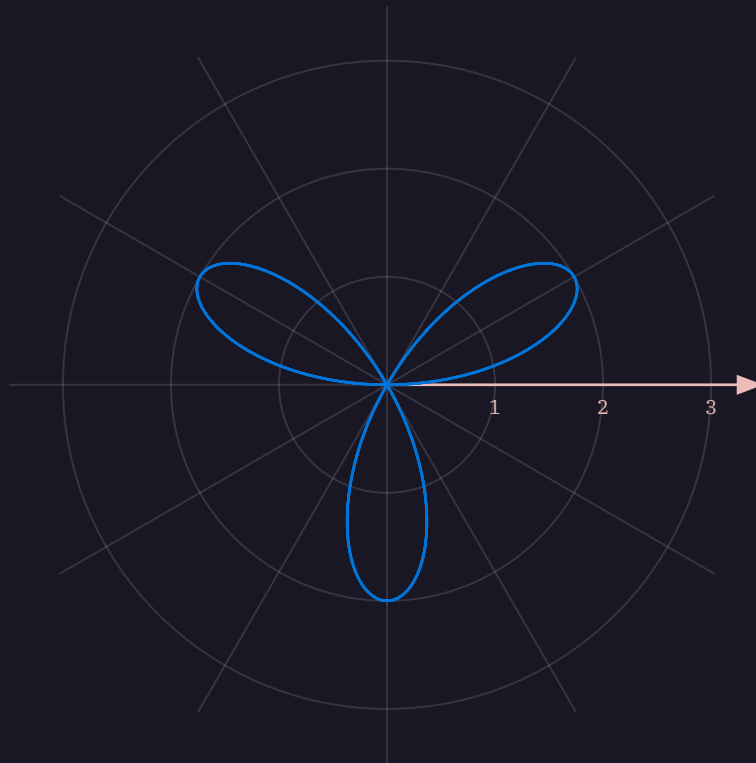## Basic Plots

Noteworthy includes a powerful plotting engine based on CeTZ.

### Rectangular Plots

## Polar Plots


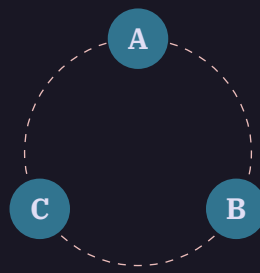
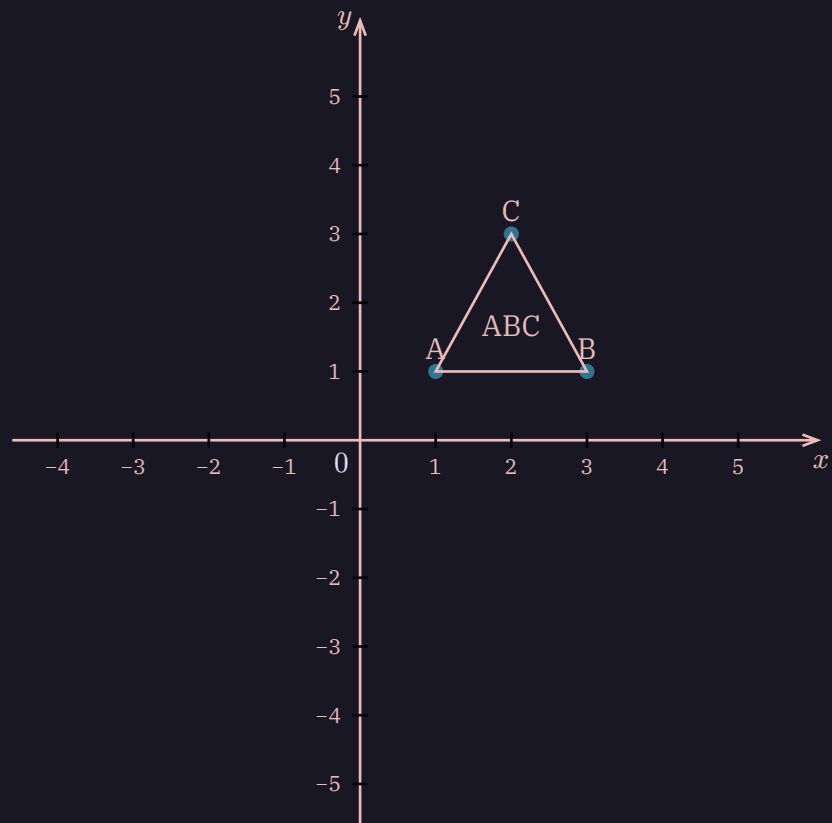## Blank Plots (Combi-plot)

Useful for diagrams without axes.

# *Geometry (Geoplot)*

## Geometry (Geoplot)

The `geoplot` module provides tools for Euclidean geometry constructions.

### Points & Polygons
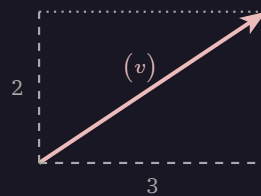
# *Vectors* (*Vectorplot*)

## Vectors (Vectorplot)

Visualize vectors and vector operations.

### Vector Drawing

$$(v) \quad (u)$$
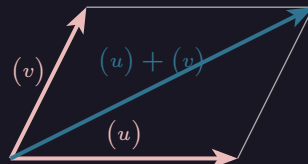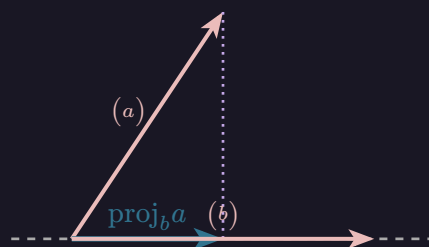
### Vector Components

Shows the x and y components of a vector.

$$(v) \quad 2 \quad 3$$

### Vector Addition

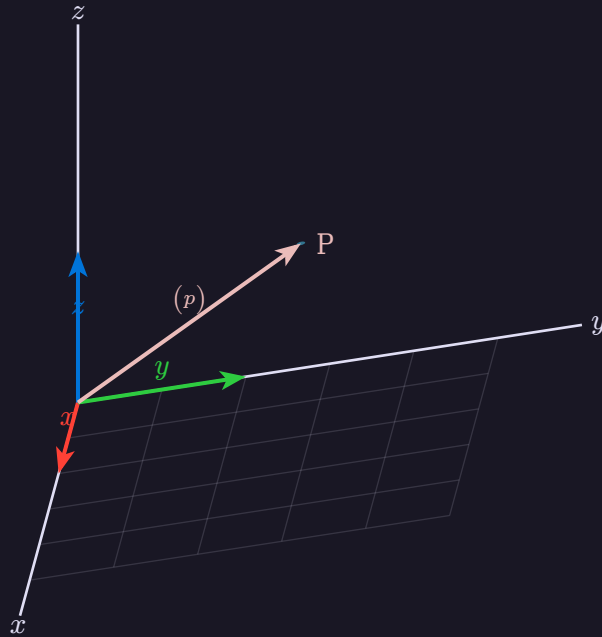$$(v) \quad (u) + (v) \quad (u)$$

### Vector Projection

$$(a) \quad \text{proj}_b a \quad (b)$$

# *3D Space (Spaceplot)*

## 3D Space (Spaceplot)

Render 3D scenes with correct perspective.

Chapter 03

# Data & Visualization

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

# *Function Graphs*
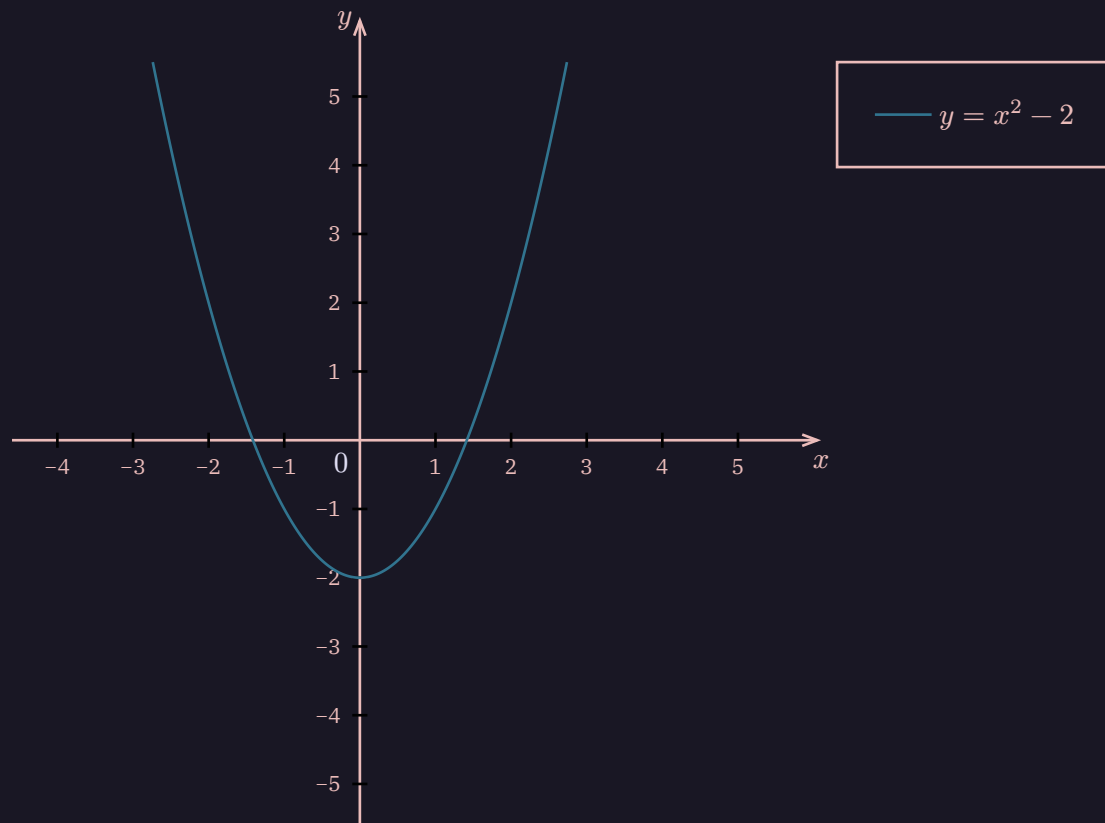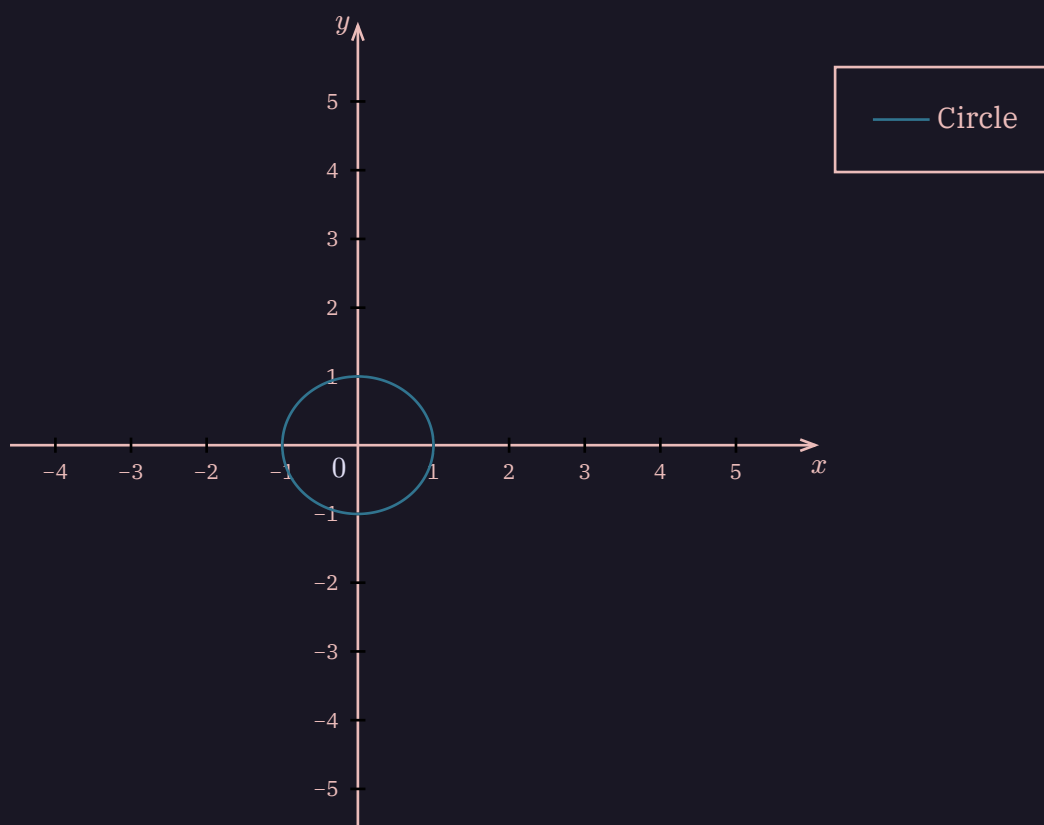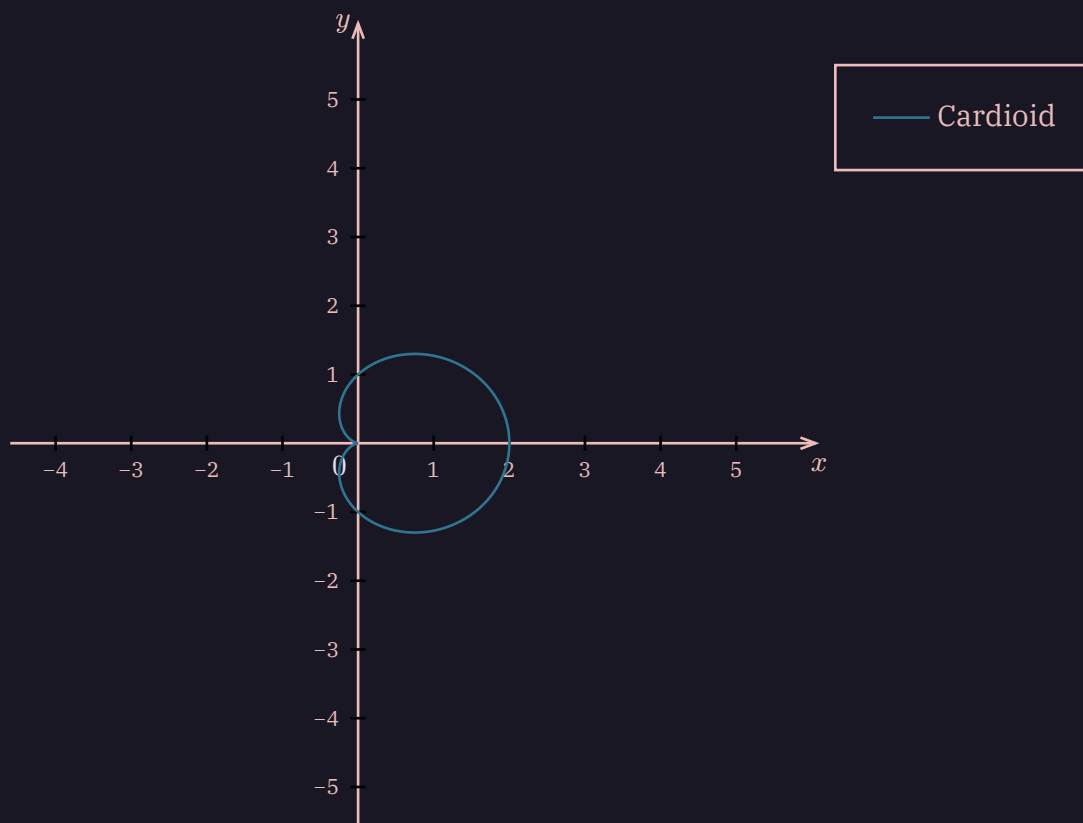
## Function Graphs

Plot mathematical functions easily.

### Cartesian Functions



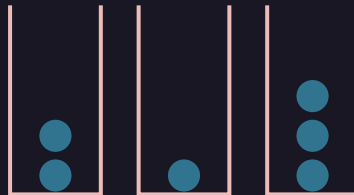$$y = x^2 - 2$$

# Parametric Functions



# Polar Functions
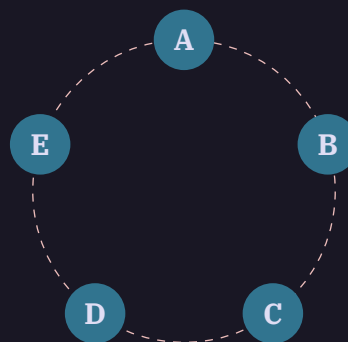
# *Combinatorics*

## Combinatorics

Visualizations for counting problems.

### Stars and Bars (Boxes)

### Linear Arrangements

### Circular Arrangements

# *Tables*

## Tables

Themed tables for data presentation.

### Standard Table

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

### Compact Table

| ID | Status |
|-----|--------|
| 001 | OK |
| 002 | Fail |
| 003 | OK |

### Value Table (Function Values)

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

### Grid Table

| 100 | 120 |
|-----|-----|
| 110 | 130 |