

Elegant Mathematics with the Pi Theme

A Demonstration of the Atrajit-Pi Academic Package

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Abstract

This document demonstrates the elegant `atrajit-pi` theme, featuring warm academic colors, sophisticated typography, and pi-themed decorations. The package provides a complete professional look for mathematical documents, research papers, and academic notes.

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1 Introduction to the Pi Theme

The `atrajit-pi` package provides an elegant alternative to the original `atrajit` theme. Key features include:

- ▷ Warm color palette (browns and golds) for sophisticated appearance
- ▷ Pi-themed decorative elements throughout
- ▷ Hexagonal and circular badge designs
- ▷ Enhanced theorem environments with colored frames
- ▷ Elegant ornamental headers and footers

1.1 Color Scheme

The theme uses a carefully selected academic color palette:

- ▷ **Primary:** Saddle Brown for main elements
- ▷ **Secondary:** Dark Goldenrod for accents
- ▷ **Accent:** Peru for highlights
- ▷ **Background:** Wheat for subtle fills

2 Mathematical Environments

2.1 Theorem Environments

The pi theme includes beautifully styled theorem environments:

Theorem 2.1 (Fundamental Theorem of Calculus). *Let f be continuous on $[a, b]$. Then*

$$\int_a^b f(x) dx = F(b) - F(a)$$

where F is any antiderivative of f .

Proof. This follows from the definition of the definite integral and the chain rule. □

Lemma 2.2. *Every bounded sequence in \mathbb{R}^n has a convergent subsequence.*

Proposition 2.3. *The set \mathbb{Q} of rational numbers is countable.*

Corollary 2.4. *The set of algebraic numbers is also countable.*

2.2 Definitions and Examples

Definition 2.5 (Metric Space). A *metric space* is a pair (X, d) where X is a set and $d : X \times X \rightarrow \mathbb{R}$ satisfies:

1. $d(x, y) \geq 0$ with equality iff $x = y$
2. $d(x, y) = d(y, x)$ (symmetry)

3. $d(x, z) \leq d(x, y) + d(y, z)$ (triangle inequality)

Example 2.6. The Euclidean space \mathbb{R}^n with the standard metric $d(x, y) = \|x - y\|$ forms a metric space.

Remark 2.7. Not every topological space can be metrized.

3 Special Features

3.1 Custom Markers

The pi theme includes several custom markers:

TODO ★ This is a TODO item that needs attention.

🔔 Note: This is an important note to remember.

⚠ Important: This highlights critical information.

3.2 Text Highlighting

You can emphasize mathematical terms using `\mathterm{term}`: The **eigenvalue** is a fundamental concept.

For definitions, use `\defterm{term}`: A **manifold** is a topological space.

3.3 Key Concept Box

Use the `\keybox` command for important concepts:

Key Insight: The relationship between π and e is given by Euler's identity:

$$e^{i\pi} + 1 = 0$$

This is considered one of the most beautiful equations in mathematics.

4 Mathematical Examples

4.1 Important Constants

The constant π appears throughout mathematics:

$$\int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi} \quad (4.1)$$

$$\zeta(2) = \sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6} \quad (4.2)$$

4.2 Complex Analysis

Theorem 4.1 (Residue Theorem). Let f be analytic inside and on a simple closed contour C except for isolated singularities. Then:

$$\oint_C f(z) dz = 2\pi i \sum \text{Res}(f, z_k)$$



5 Conclusion

The `atrajit-pi` theme provides a sophisticated, elegant alternative for academic documents. Simply change your package declaration from `\usepackage{atrajit}` to `\usepackage{atrajit-pi}` to transform your document's appearance.



Happy typesetting with the Pi theme!