

**CONTENTS****Table of Contents**

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**1 Document Structure and Navigation**

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Framing a Chapter  
Naming Sections and Subsections  
Referencing Core Elements  
Where Definitions Enter

---

**2 Figures and Margin Assets**

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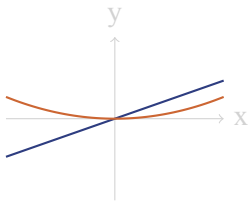
Margin Figures in Practice  
Body Floats and Anchors  
Inline Callouts

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**3 Structured Statements and Examples**

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Choosing the Right Box  
Demonstration Boxes  
Layering Cross References  
Quick Author Checklist

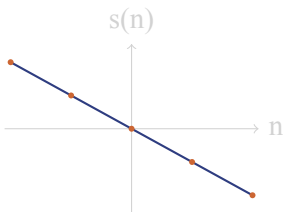
**CHAPTER 1****Document Structure and Navigation****1.1 Framing a Chapter**

**FIGURE 1.1.** Basic line and curve showing the space reserved by `\ChapterHeading`.

Use `\ChapterHeading` to stamp the title block and reset counters for equations, theorems, examples, and margin figures. The macro also updates running headers, so each chapter advertises itself in the page margin. A minimal chapter file starts with

```
\ChapterHeading{<chapter number>}{<chapter title>}
\label{ch:...}
```

Always follow the heading with a `\label`. Later cross references, such as Chapter 1, rely on unique chapter labels.

**1.2 Naming Sections and Subsections**

**FIGURE 1.2.** Step graph showing how numbered headings drop into place.

Section headers use `\SectionBar{<number>}{<title>}`. The number argument is flexible: supply either the exact printed identifier (e.g. 1.2) or a short descriptor like Remark for specialised sections. Pair each heading with a label, such as Section 1.1, so the table of contents can link directly into the narrative.

The paragraph spacing after a section heading is tuned for single-paragraph introductions. If you need more room before the first line, insert a manual `\vspace` adjustment beneath the heading—keep those changes local so the default rhythm stays intact elsewhere.

**1.3 Referencing Core Elements**

Referencing is central to the style:

- `\ref{label}` prints the counter (Chapter 1).
- `\nameref{label}` prints the friendly name ().
- `\eqref{label}` encloses the equation number, as in Equation (1.1).

$$s(x) = \sum_{k=0}^n a_k x^k \quad (1.1)$$

Give every float, theorem-style box, example, and equation a descriptive label so readers mapping your notes to the examples here never guess which object you cite.

## 1.4 Where Definitions Enter

### DEFINITION 1.1 *Styled Definition*

A *styled definition* pairs semantic emphasis with a consistent caption. The environment `\begin{definitionBox}{<title>}` ... automatically supplies the definition counter and the accent panel.

### THEOREM 1.1 *Spacing Checklist*

Theorem boxes follow the same pattern. Keeping their counters in sync means you can reference Theorem 1.1 or Definition 1.1 without additional macros.

### Example 1.1

### Quick Reference Card

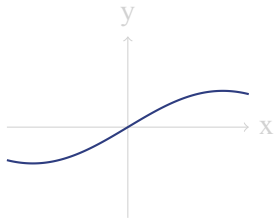
$$\chi(y) = y^2 - 1$$

**Solution** Use the example environment for printable study cards: its banner and solution tag mimic the final design.

Examples and definitions are natural places to remind readers how to refer back to earlier material. For instance, Example 1.1 cites Definition 1.1 to show cross-links between environments.

## CHAPTER 2 Figures and Margin Assets

### 2.1 Margin Figures in Practice



**FIGURE 2.1.** Every call to `\MarginFigureAuto` produces a numbered figure in the outer margin.

`\MarginFigureAuto` accepts an optional vertical offset, the TikZ (or image) content, and the caption text. Because the template enforces left-side placement, margin art stays aligned with the spine no matter which page holds it. When you reference Figure 2.1, readers can scan margins to locate the artwork without worrying about parity.

Spacing tip: tweak the optional offset (default 0pt) to nudge a figure toward the paragraph it supports. Positive values move the art downward; negative values pull it upward.

### 2.2 Body Floats and Anchors

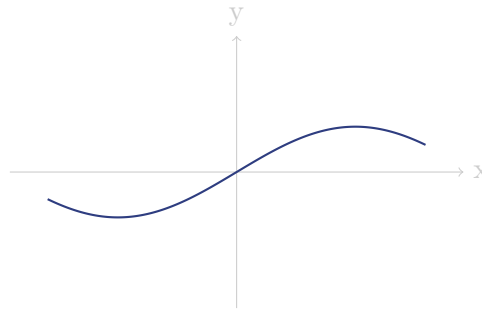


Figure 2.1: A centred sine curve anchored with the `[H]` placement specifier.

For figures inside the main text column, combine the standard `figure` environment with the `H` placement specifier from the `float` package to anchor the illustration near its mention. Without `[H]`, LaTeX may shuffle the figure earlier or later to fill whitespace, which is why Figure 2.1 would otherwise drift toward the top of the chapter.

Keep captions brief and action-oriented. They sit directly under the illustration and are automatically numbered for cross references like Figure 2.1.

### 2.3 Inline Callouts

Margin figures work best when paired with in-text cues:

- Signal the reader using “see Figure 2.1” language.

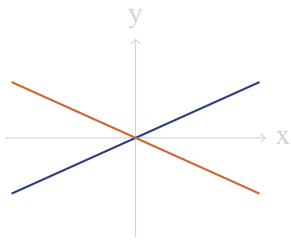
- Reserve `\marginnote` for short callouts; longer commentary fits better in the main column.
- When multiple figures appear back-to-back, mention each explicitly so the reader knows which panel matches your explanation.

If you later replace a TikZ sketch with an imported image, swap the drawing code with `\includegraphics[width=\linewidth]{<file>}` inside `\MarginFigureAuto`. The surrounding macro keeps the caption styling identical.

## CHAPTER 3

## Structured Statements and Examples

## 3.1 Choosing the Right Box



**FIGURE 3.1.** Intersecting lines acting as a quick visual cue for Chapter 3.

Three pre-styled environments give your mathematical prose consistent rhythm:

**theoremBox** For claims and proofs.

**definitionBox** For vocabulary and notation.

**textexample** For worked exercises with solutions.

Each increments a chapter-specific counter, ensuring Definition 3.1 and Theorem 3.1 share the same chapter index. Use descriptive titles to orient readers before they dive into the details.

## 3.2 Demonstration Boxes

**DEFINITION 3.1** *Sample Definition*

Let  $V$  be a vector space. A *styled span* is the set  $\text{span}\{v_1, \dots, v_k\}$  embellished with the accent palette defined in . Nothing about the mathematics changes—only the wrapper.

**THEOREM 3.1** *Sample Theorem*

Styled spans form a subspace of  $V$ . This mirrors traditional linear algebra results while showcasing how theorem captions pick up the highlight colour.

**Example 3.1****Referencing Styled Spans**

$$T(\mathbf{x}) = A\mathbf{x}, \quad A = \begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix}$$

**Solution** Reference Definition 3.1 when explaining why the column space of  $A$  is a styled span. The example banner stretches into the margin to create a visual entry point for students scanning for practice problems.

Pair these environments to build exposition, proposition, and practice sections without writing new TikZ or colour definitions each time.

### **3.3** Layering Cross References

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When composing longer notes, tie statements together explicitly:

- Mention Definition 3.1 before calling on Theorem 3.1.
- Cite Example 3.1 in homework instructions so readers know which worked solution to re-read.
- Mix chapter references—compare this chapter with the margin guidance in Chapter 2 to explain where visual aids should appear.

Explicit cross references keep the instructional tone coherent. They also make it easy to search the compiled PDF for the label names when students ask follow-up questions.

### **3.4** Quick Author Checklist

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Before moving on to subject-matter writing, verify the following:

1. Every theorem, definition, example, figure, and important equation has a label.
2. Chapter introductions include a short paragraph that explains the chapter purpose.
3. Margin figures sit next to their references (adjust offsets as needed).
4. The table of contents lists only the sections you intend to publish.

The checklist above doubles as a template for future reference chapters—copy the format, change the text, and reuse labels with new chapter prefixes to keep the structure predictable.