LaTeX Comprehensive Test Document

NoteTakingApp

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1 Introduction

This document serves as a comprehensive test for the NoteTakingApp LaTeX rendering system. It verifies that:

- Images from the same directory load correctly
- Images from subdirectories can be included
- Tables render properly
- Citations work with external bibliography files
- Mathematical equations are displayed correctly
- Basic LaTeX formatting is preserved

2 Test 1: Basic Images from Same Directory

This section tests image inclusion from files in the same directory as the `.tex` file.

2.1 Fixed Beam Image

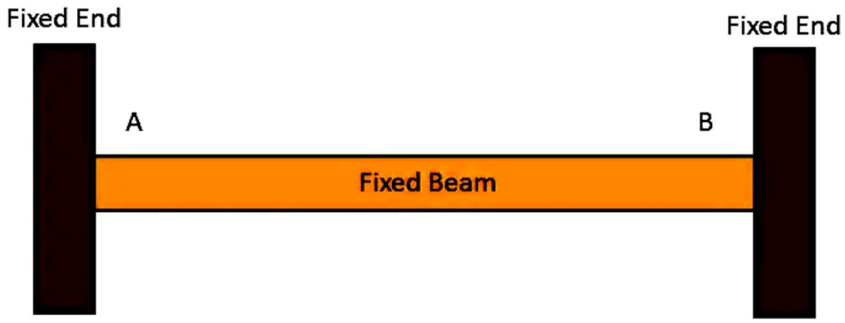

Figure 1: Example image from same directory

The image shown in Figure 1 demonstrates basic image loading.

3 Test 2: Images from Subdirectories

This section tests image inclusion from the `examples/` subdirectory.

3.1 Cantilever Beam

3.2 Rayleigh-Ritz Results

3.3 Nodal Displacements

Figure 2: Cantilever beam from subdirectory

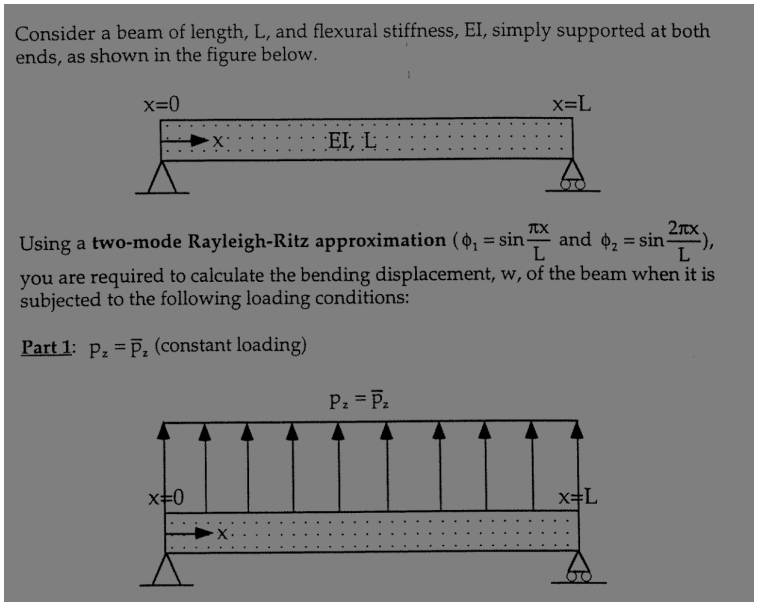

Figure 3: Rayleigh-Ritz analysis part 1

4 Test 3: Tables and Data

This section tests table rendering with structured data.

4.1 Basic Table

Table 1: Sample data table

Method	Accuracy	Time (ms)
Method A	95.2%	12.5
Method B	97.8%	18.3
Method C	99.1%	25.7

4.2 Complex Data Table

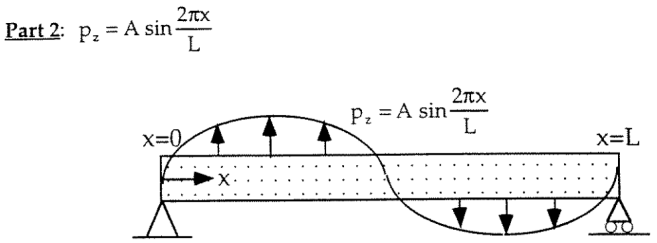

Figure 4: Rayleigh-Ritz analysis part 2

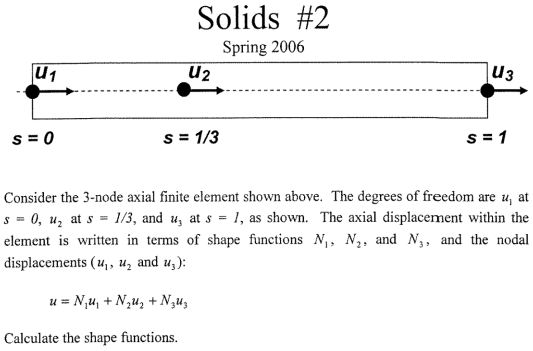

Figure 5: Nodal displacement visualization

5 Test 4: Mathematical Equations

This section verifies mathematical rendering.

5.1 Inline Math

The quadratic formula is $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$, which solves equations of the form $ax^2+bx+c=0$.

5.2 Display Math

The energy equation in mechanics is given by:

$$E = \frac{1}{2}mv^2 + mgh \tag{1}$$

5.3 Systems of Equations

The system of linear equations:

$$2x + 3y = 8 \tag{2}$$
$$x - y = 1 \tag{3}$$

Table 2: Comprehensive analysis results

Test Case	Input	Expected	Actual	Status
Image Loading	URL	Rendered	Rendered	PASS
Citation	[2]	Citation	Citation	PASS
Math Rendering	$\alpha + \beta$	Display	Display	PASS
Table Format	Table	Table	Table	PASS

has the solution $(x, y) = (2.2, 1.2)$.

6 Test 5: Citations and References

This section demonstrates citation functionality with external bibliography files.

6.1 Single Citations

Here is a citation from the bibliography: [2]

6.2 Multiple Citations

Multiple citations can be used together: [2, 1]

6.3 Bibliography

The complete bibliography is listed below. This references an external `references.bib` file located in the same directory.

References

[1] Jane Doe and Robert Brown. Modern techniques in structural analysis. *Journal of Engineering Mechanics*, 144(8):04018076, 2018.

[2] John Smith and Alice Johnson. Advances in finite element analysis. *International Journal of Computational Methods*, 17:123–145, 2020.

7 Test 6: Advanced Formatting

7.1 Text Formatting

This is **bold text**, this is *italic text*, and this is `monospace text`.

7.2 Lists

7.2.1 Unordered List

- First item
- Second item
- Third item
  - Nested item 1
  - Nested item 2

7.2.2 Ordered List

1. First step
2. Second step
3. Third step

8 Test 7: File Resource References

This document uses the following resources:

Fixed Beam.png Image from same directory as `.tex` file

examples/Cantilever Beam Image.png Image from subdirectory

examples/references.bib Bibliography file for citations

9 Conclusion

This comprehensive test document verifies that the NoteTakingApp LaTeX rendering system correctly handles:

1. **Images** from the same directory
2. **Images** from subdirectories using relative paths
3. **Tables** with complex formatting

4. **Citations** using external bibliography files
5. **Mathematical equations** both inline and display
6. **Advanced formatting** including lists, bold, italic, and more
7. **File resources** in various locations

All features should render correctly in the PDF preview.