

# LaTeX Ecosystems Coursework Semester 2

Baciu Nichita

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# 1 Introduction

Here is the introduction for the future exercises in LaTeX to show our skills.

## 1.1 Formatting Text

This is the example of **bold** and *italic* text.

# 2 Mathematical Notation

Example of the mathematical equation:

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad (1)$$

# 3 BibTeX

Here we can show how to make BibTeX reference using natbib:

A rose by any other name would smell as sweet.[1].

# References

[1] William Shakespeare. Romeo and juliet. 1597.

# 4 Table Example

Here is an example of a table:

Name	Age
Nichita	19
Bob	21

# 5 Font families

Here is the example of:

- Serif: This is serif font.
- Sans-serif: This is sans-serif font.
- Monospace: This is monospace font.

# 6 Rulers

Example of a full-width ruler:

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## 7 Spaces

Examples of horizontal and vertical spaces:

Here is text                      with a horizontal space.  
 Here is text

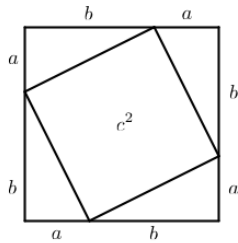
With a vertical space

## 8 Theorems and Proofs

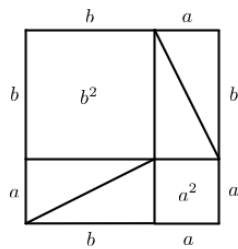
Pythagorean theorem.

**Theorem 1.** *In a right triangle, the squared hypotenuse is equal to the sum of squared legs*

*Proof.* Given any right triangle with legs  $a$  and  $b$  and hypotenuse  $c$  like the above, use four of them to make a square with sides  $a+b$  as shown below:



This forms a square in the center with side length  $c$  and thus an area of  $c^2$ . However, if we rearrange the four triangles as follows, we can see two squares inside the larger square, one that is  $a^2$  in area and one that is  $b^2$  in area:



Since the larger square has the same area in both cases, i.e.  $(a+b)^2$ , and since the four triangles are also the same in both cases, we must conclude that the two squares  $a^2$  and  $b^2$  are in fact equal in area to the larger square  $c^2$ . Thus,  $a^2 + b^2 = c^2$ .  $\square$