

# THE 18.821 MATHEMATICS PROJECT LAB REPORT

YOUR NAMES HERE.

ABSTRACT. This is the LaTeX template for 18.821, which you can use for your own reports. Please keep the abstracts short and to the point.

## 1. INTRODUCTION

Your introduction section should convey the motivation and main point of the project. Avoid generalized philosophical or historical remarks (à la “Ever since the beginning of human culture . . .”), or lists of known results. This is a project report and not a survey article! Technical definitions are better kept out of the introduction. The aim should be to get the right informal picture into the reader’s head, which may take some effort.

A good way to end the introduction is to say quickly what the contents of the following sections are, and which team member wrote them. For instance, Section 6 is totally useless, and is written by me.

## 2. LATEX EXAMPLES

Here are some ways of producing mathematical symbols. Some are pre-defined either in LaTeX or in the AMS package which this document loads. For instance, sums and integrals,  $\sum_{i=1}^n 1 = n$ ,  $\int_0^n x \, dx = n^2/2$ . We’ve defined a few other symbols at the start of the document, for instance  $\mathbb{N}, \mathbb{Q}, \mathbb{Z}, \mathbb{R}$ .

Unfinished here?

If you want to typeset equations, there are many choices, with or without numbering:

$$\int_0^1 x \, dx = 1/2,$$

or

$$\sum_{i=1}^{\infty} i = -\frac{1}{12}$$

or

$$1 - 1 + 1 - \cdots = \frac{1}{2}.$$

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*Date:* December 32,2009.

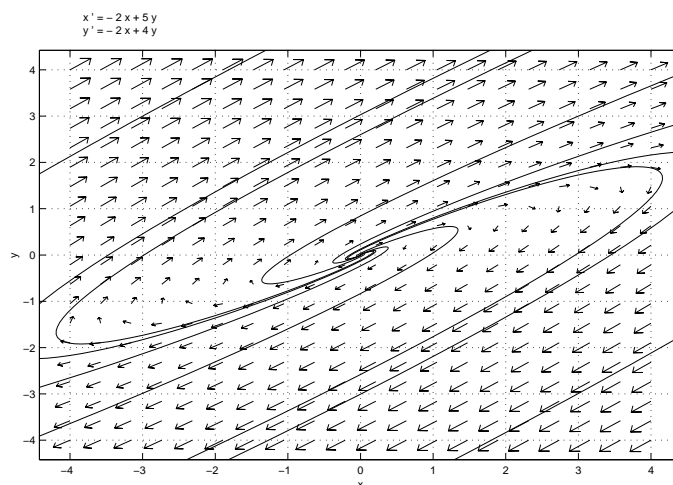


FIGURE 1. My first figure.

If you want a number for an equation, do it like this:

$$(1) \quad \lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{1}{k^2} = \frac{\pi}{6}.$$

This can then be referred to as (1), which is much easier than keeping track of numbers by hand. To group several equations, aligning on the = sign, do it like this:

$$\begin{aligned}
 x_1 + 2x_2 + 3x_3 &= 7 \\
 y &= mx + c \\
 &= 4x - 9.
 \end{aligned}$$

### 3. IMAGES

Figure 1 is an example of .eps (Postscript) drawing put into a floating environment, which means LaTeX will draw it wherever there's enough space left in your manuscript. To draw images which can be saved as .eps, use your favorite graphics program such as (under Linux or Unix) xfig or gimp.

### 4. THEOREMS AND SUCH

An example of a “conjecture environment” is given below, in Conjecture 4.1. Theorems, lemmas, propositions, definitions, and such all use the same command with the appropriate name changed. In fact,

if you look at the top of this .tex file, you can see where we've defined these environments.

**Conjecture 4.1** (Vaught's Conjecture). *Let  $T$  be a countable complete theory. If  $T$  has fewer than  $2^{\aleph_0}$  many countable models (up to isomorphism), then it has countably many countable models.*

**Theorem 4.2.** *It never rains but it pours.*

*Proof.* Well

□

## 5. FILETYPES USED BY L<sup>A</sup>T<sub>E</sub>X

You write your text as a .tex file using any text editor (but not Word, obviously, unless you choose to save your files as plain text files). Running LaTeX then transforms this into a .dvi file, which can be viewed on the screen using a dvi viewer. To include images, and then prepare the file for printing, one typically translates the .dvi into either .ps (Postscript) or .pdf (Adobe PDF).

Under Linux or Unix for example, the commands are

```
latex filename.tex
```

which produces filename.dvi, and then

```
dvips -f filename.dvi > filename.ps
```

followed by

```
ps2pdf filename.ps.
```

If the file does not contain embedded Postscript images, .pdf output can be obtained directly using

```
pdflatex filename.tex.
```

Finally, Matlab can be made to produce .eps files by typing

```
print -deps filename
```

at the prompt. The analogous procedures under Windows depend on what distribution of LaTeX you've installed. Under MikTeX with WinEdt, all necessary commands will appear under "Accessories" in the WinEdt menu.

## 6. QUOTING SOURCES

As you prepare your project, remember to keep notes of the literature you've used, including websites. Not to do so is to risk allegations of plagiarism. When you use parts of books, try to quote precisely, meaning [1, pages 76–78] instead of just [1].

## REFERENCES

- [1] Gurps, P., Care and feeding of maths professors. Cambridge Univ. Press, 2008.
- [2] Burps, X. Terrors and errors of project lab. *Journal of Wildlife and Conservation* 21 (2008), 112–134.

## APPENDIX

Appendices are useful for putting in code or data.