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UNIVERSITY OF CALIFORNIA  
SANTA CRUZ

**A SUPER AWESOME TITLE OF EXCELLENT WORK**

A dissertation submitted in partial satisfaction  
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

MATHEMATICS

by

**Your name**

June 2023

The Dissertation of Your name  
is approved:

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Professor Chair, Chair

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Professor 1

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Professor 2

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Peter Biehl  
Vice Provost and Dean of Graduate Studies

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2023

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## **Abstract**

A super awesome title of excellent work

by

Your name

This is abstract!

Yes. Abstract.



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*For whatever*

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## Acknowledgements

Thanks

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**Part I.**

**Sample**

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# Chapter 1.

## Sample Chapter

### § 1.1. Font

Fonts are in file `preamble/font`.

- Text use mainly PS Type 1 font based on Times. This is done by `newtxtext`.
- Math fonts: use package `newtxmath` and `mathalpha`. I minimize the package usage, for instance, no `amssymb` (as the symbols are already in `newtxmath`).

### § 1.2. Layout

Preambles for layout (in file `preamble/layout`):

- For page: use package `geometry`
- For header and footer: use package `scrlayer-scrpage`
- For line spacing: use package `setspace`

- For footnote<sup>\*\*\*</sup>: use package `footmisc`

## § 1.3. Sections

In file `preamble/section`.

- chapter prefix: `true`
- section prefix: `§`
- headings: `font=standardclasses, size=normal`

## § 1.4. Table and Figure

Here is a table ([Table 1.1](#)) and a figure ([Fig. 1.1](#)):

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

Table 1.1.: Table to test captions and labels.



Figure 1.1.: The banana slug

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<sup>\*</sup>This is one footnote

<sup>\*\*</sup>This is another footnote.



## § 1.5. Math notations

Font families:

- ABC: *ABCDEFGHIJKLMNOPQRSTUVWXYZ*
- abc: *abcdefghijklmnopqrstuvwxyz*
- bold italic ABC: ***ABCDEFGHIJKLMNOPQRSTUVWXYZ***
- bold italic abc: ***abcdefghijklmnopqrstuvwxyz***
- bold ABC: **ABCDEFGHIJKLMNOPQRSTUVWXYZ**
- bold abc: **abcdefghijklmnopqrstuvwxyz**
- sans-serif ABC: *ABCDEFGHIJKLMNOPQRSTUVWXYZ*
- sans-serif abc: *abcdefghijklmnopqrstuvwxyz*
- blackboard bold ABC: *ABCDEFGHIJKLMNOPQRSTUVWXYZ*
- blackboard bold abc: *abcdefghijklmnopqrstuvwxyz*
- calligraphic ABC: *ABCDEFGHIJKLMNOPQRSTUVWXYZ*
- script ABC: *ABCDEFGHIJKLMNOPQRSTUVWXYZ*
- script abc: *abcdefghijklmnopqrstuvwxyz*
- fraktur ABC: *ABCDEFGHIJKLMNOPQRSTUVWXYZ*
- fraktur abc: *abcdefghijklmnopqrstuvwxyz*

See the effects of math font setting:

- numbers: 0123456789
- Greeks upper:  $\Gamma, \Delta, \Xi, \Theta, \Lambda, \Xi, \Pi, \Sigma, \Upsilon, \Phi, \Psi, \Omega$
- Greeks lower:  $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, \pi, \rho, \sigma, \tau, \upsilon, \phi, \chi, \psi, \omega$
- Greek var:  $\Gamma, \Delta, \Theta, \Lambda, \Xi, \Pi, \Sigma, \Upsilon, \Phi, \Psi, \Omega, \epsilon, \vartheta, \varpi, \varrho, \varsigma, \varphi$
- uvw v.s. nu omega:  $u, v, w, \nu, \omega$
- yg f and rho:  $y, g, f, \rho$
- special letters:  $\aleph, \beth, \daleth, \beth, \delta, \mathfrak{J}, \mathfrak{K}, \iota, j, \mathfrak{l}, \mathfrak{j}, \ell, \hbar, \hbar, \wp, \lambda, \lambda, \mathfrak{z}, \mathbb{Z}$
- special notations:  $\mathbb{A}, \partial, \nabla, \infty, \forall, \exists, \sharp, \flat, \natural, \dagger, \ddagger, \mathbb{C}, \mathbb{U}, \emptyset, \emptyset, \odot$
- binary relations:  $\in, \ni, \not\in, \subseteq, \supseteq, \subset, \supset, \subsetneq, \supsetneq, \triangleleft, \triangleright, \trianglelefteq, \trianglerighteq, \leq, \geq, \leqslant, \geqslant, \ll, \gg, \langle, \rangle, \ltimes, \vdash$
- equivs:  $\equiv, \cong, \sim, \approx, \asymp, \doteq, \neq, :=, \Longleftrightarrow, ::$

Some macros:

- Delimiters:  $\left| \frac{a}{y} \right|, \left\| \frac{a}{y} \right\|, \left\langle \frac{a}{y} \right\rangle, \left( \frac{a}{y} \right), \left[ \frac{a}{y} \right], \left\| \frac{a}{y} \right\|, \left\{ \frac{a}{y} \right\}, \left[ \frac{a}{y} \right], \left[ \frac{a}{y} \right], \left\langle \frac{a}{y} \right|, \left| \frac{a}{y} \right\rangle, :XYZ:$
- Sets:  $\left\{ \langle \text{express} \rangle \left| \begin{array}{l} \text{condition 1,} \\ \text{condition 2} \end{array} \right. \right\}$  and  $\langle \langle \text{generators} \rangle \mid \langle \text{relations} \rangle \rangle$
- Pairings:  $\langle f \mid X \rangle, \langle f, X \rangle, (f, X).$
- Fun:  $\text{Fun}_{\text{sub}}^{\text{sup}}\left(\frac{1}{2}\right), \mathbf{G}(R), \mathbf{Ab}, \mathcal{O}(U)$
- Notations: NZQRCEKTDWMAV01

- Notations:  $|0\rangle, \mathbb{G}_m, \mathbb{G}_a, \mathcal{O}, o, \mathcal{O}, \mathbf{O}(x)$
- Supscript:  $A^H A^T A^\perp A^\lrcorner A^\vee A^\times A^\circ$
- Accents:  $\vec{u} \overline{AB} \overline{AB}_x \widehat{ABABAB} \ddot{x} \ddot{x} \ddot{x} \hat{x} \hat{x} \hat{x} \tilde{x} \tilde{x} \tilde{x} \hat{x}$

Test your macros (they are in `preambles/user-notations`):

- $\cong, A^\vee, A^{\text{op}}, \begin{bmatrix} a \\ b \end{bmatrix}, \mathbf{u}$
- $x_0, \cdots, x_n, x_0 + \cdots + x_n, x_0 \cdots \cdots x_n$
- $\mathcal{A}, {}^u\mathcal{A}, \mathcal{B}, {}^v\mathcal{B}, {}^u\mathbb{A}, {}^v\mathbb{C}, {}^v\mathcal{F}, {}^v\Phi, {}^v\Sigma, {}^v\mathcal{H}, {}^vW, {}^v\alpha, {}^v\nu, {}^{\top}f, {}^vf, {}^vC, {}^vF, {}^vW, {}^vX, \mathcal{I}$
- $\mathrm{d}, \Delta, \Sigma, \longrightarrow, \longleftarrow$

## § 1.6. Math environments

Should be defined in `preambles/envs`

**Theorem 1.6.1.** *bla bla*

*expression*

*Proof.* bla

□

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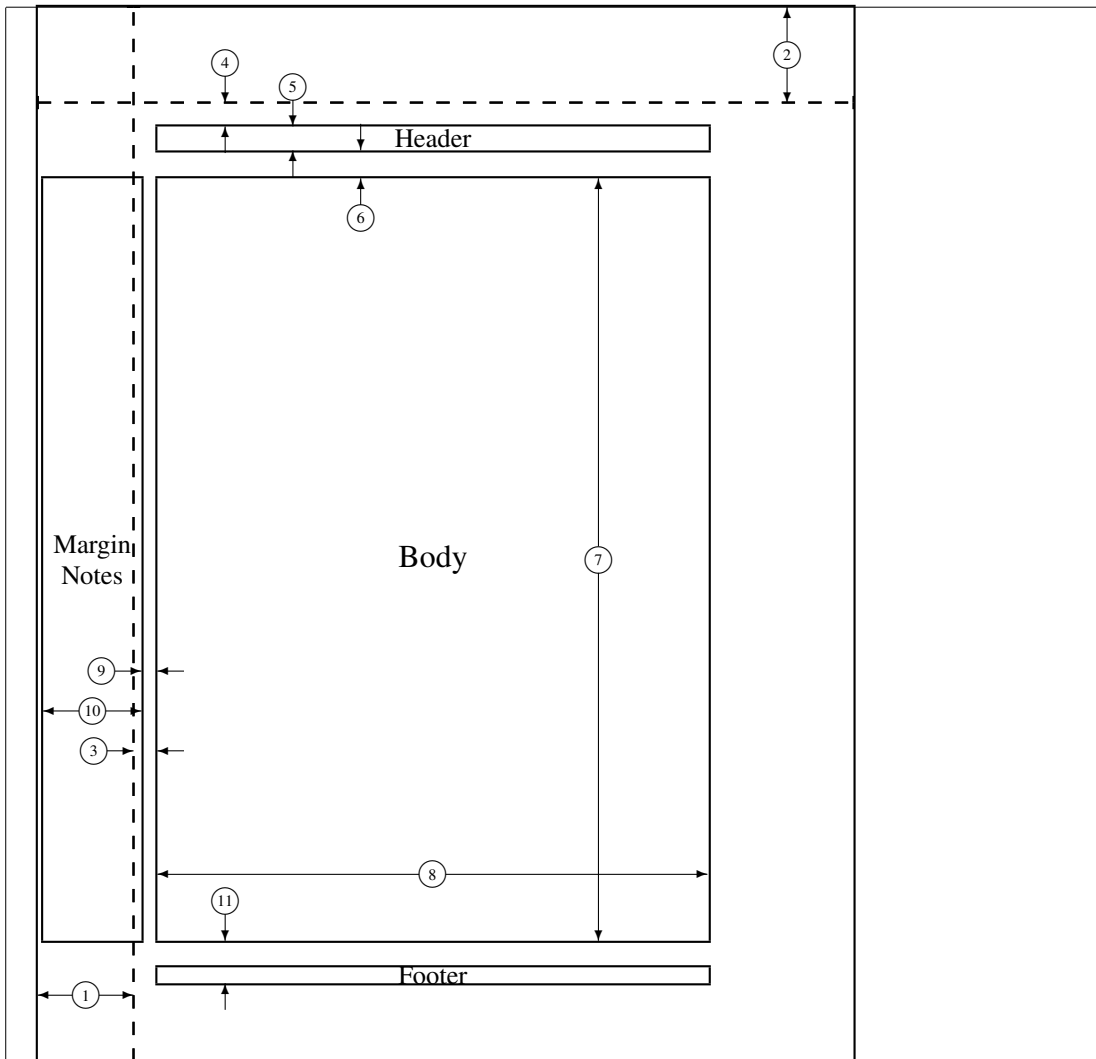
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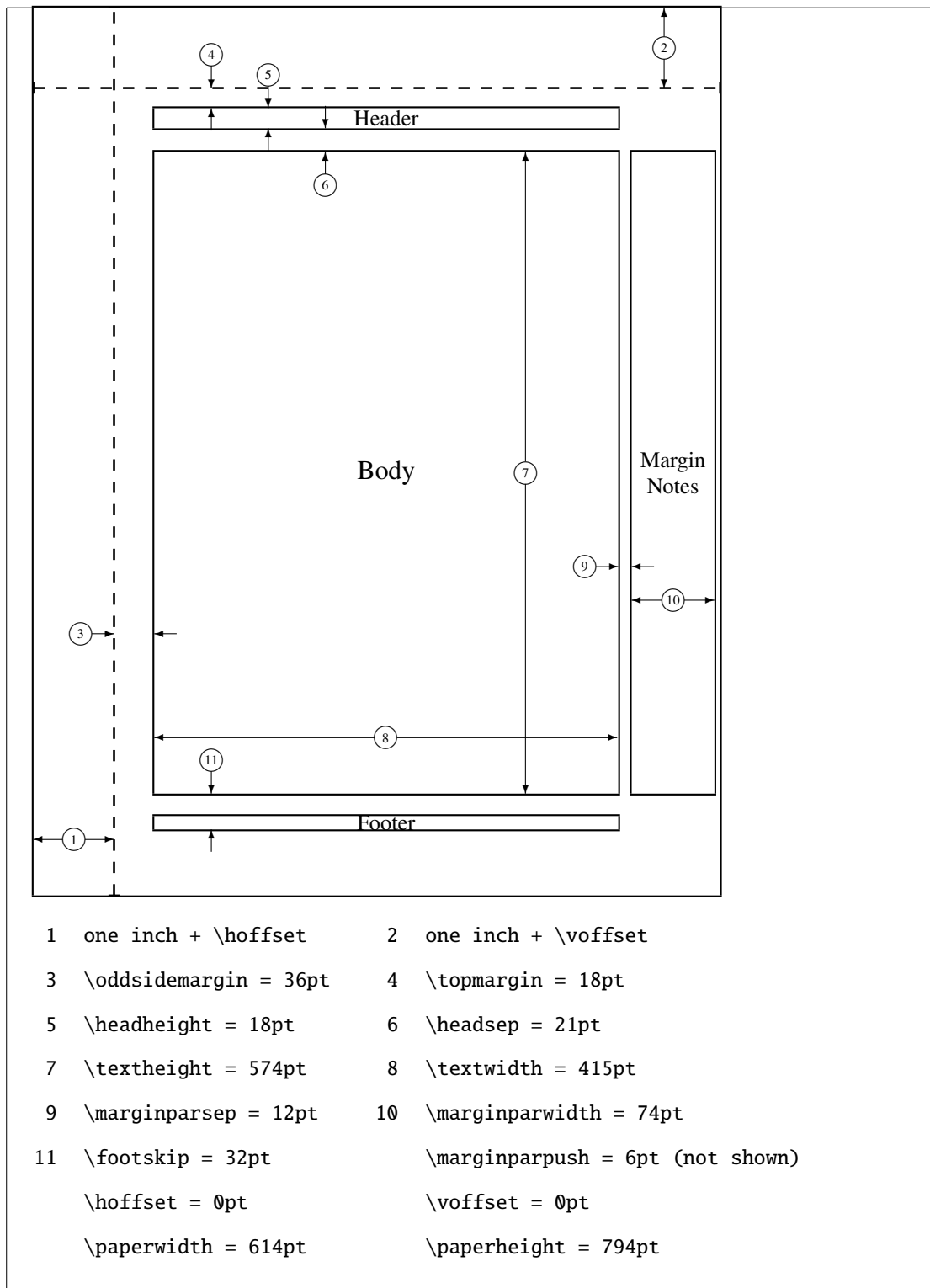
## **Appendix A.**

### **Illustrate**

#### **§ A.1. The next pages show layout**



- |                          |                                  |
|--------------------------|----------------------------------|
| 1 one inch + \hoffset    | 2 one inch + \voffset            |
| 3 \evensidemargin = 18pt | 4 \topmargin = 18pt              |
| 5 \headheight = 18pt     | 6 \headsep = 21pt                |
| 7 \textheight = 574pt    | 8 \textwidth = 415pt             |
| 9 \marginparsep = 12pt   | 10 \marginparwidth = 74pt        |
| 11 \footskip = 32pt      | \marginparpush = 6pt (not shown) |
| \hoffset = 0pt           | \voffset = 0pt                   |
| \paperwidth = 614pt      | \paperheight = 794pt             |



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