# Typesetting in LaTeX*

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(Your Photo Here)

## 1 This is the first section heading

### 1.1 Subsection heading

This is some text for the subsection.

- **Thing 1** Description of thing 1.
- **Thing 2** Description of thing 2.
  - A bulleted list at least two levels deep (this is a second-level bullet).
    - This is a third-level bullet.
    - This is a third-level bullet.
  - This is a second-level bullet[1].

## 2 Mathematics

### 2.1 Mathematical Notation

Choose a four-digit number which you will use to practice typesetting mathematical expressions. Typeset everything below, including all text just as you see it, substituting your four-digit number in place of the sample digits 1, 9, 7, 2 wherever they occur.

*Footnote for a title, this exercise is based on an exercise from `http://mrskrummel.com/tutorials.html` (See me if you're stuck on getting this typeface)

[1]This is the text for the footnote.

1. Superscripts, subscripts, and Greek letters

   (a) $19^{72} + \alpha^{\beta}$ (These are letters alpha, beta)

   (b) $1^{9^{7^2}} + \cos(\xi)$ (This is the greek letter xi)

   (c) $19_{72_{19}}$ (displaystyle gives you a little more space)

   (d) $\cos(19)\sin(72) + \pi$

   (e) $\log_{19}(72) + \sigma$ (this is the greek letter sigma)

   (f) $\ln(1972) + \psi$ (this is the greek letter psi)

2. Roots, fractions, and displaystyle, integrals and derivatives:

   (a) $\sqrt{1972} + \sqrt[3]{x^2}$

   (b) normal: $\frac{19}{72}$; displaystyle: $\dfrac{19}{72}$; compound fraction with displaystyle: $\dfrac{1}{9 + \frac{7}{2}}$

   (c) normal: $\int_{19}^{72} f(x)\,dx$; displaystyle $\displaystyle\int_{19}^{72} f(x)\,dx$

   (Hint- you don't need to typeset this... I used a small space: `\,` between the $f(x)$ and the $dx$)

   (d) Using display math mode:

$$\frac{d}{dx}\int_{19}^{72} f(x)\,dx = 0$$

3. Limits, sums and delimiters

   (a) Using display math mode:

$$\lim_{n\to\infty}\sum_{j=1}^{n} f(x_j^*)\Delta x_j = \int_a^b f(x)\,dx$$

   (b) A limit using inline math: $\lim_{n\to\infty} \frac{1}{n} = 0$

   (c) Using display math mode, a piecewise defined function:

$$f(x) = \begin{cases} 19 & \text{if } 0 \le x < 1 \\ 72 & \text{if } 1 \le x \le 2 \end{cases}$$

   (d) Use delimiters that automatically re-size (in display math mode):

$$\left(1 + \frac{19}{72}\right) \cdot \left[1 + \frac{19}{72}\right]$$

4. A table and equation arrays:

   (a)

| $x$ | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| $f(x)$ | 1 | 9 | 7 | 2 |

   (b)

$$\begin{aligned} 1 + 9 - 7 * 2 &= x && (1) \\ 1 + 9 - 14 &= x && (2) \\ x &= -4 && (3) \end{aligned}$$