Purpose of this Document

This short sample document illustrates the typeset appearance of in-line and displayed mathematics in documents. It also illustrates five levels of section headings and three kinds of lists. Finally, the document includes entries for a manual bibliography and an appendix.

Sample Mathematics and Text

In-line and Displayed Mathematics

The expression $\sum_{i=1}^{\infty} a_i$ is in-line mathematics, while the equation

$$\sum_{i=1}^{\infty} a_i \tag{1}$$

is displayed and numbered as equation (!).

Let H be a Hilbert space, C be a closed bounded convex subset of H, T a nonexpansive self map of C. Suppose that as $n \to \infty$, $a_{n,k} \to 0$ for each k, and $\gamma_n = \sum_{k=0}^{\infty} (a_{n,k+1} - a_{n,k})^+ \to 0$. Then for each x in C, $A_n x = \sum_{k=0}^{\infty} a_{n,k} T^k x$ converges weakly to a fixed point of T.

Two sets of LaTeX parameters govern mathematical displays. The spacing above and below a display depends on whether the lines above or below are short or long, as shown in the followning examples.

A short line above:

$$x^2 + y^2 = z^2$$

and a short line below.

A long line above may depend on your margins

$$\sin^2\theta + \cos^2\theta = 1$$

as will a long line below. This line is long enough to illustrate the spacing for mathematical displays, regardless of the margins.

Mathematics in Section Heads $\int_{\alpha}^{\beta} \ln t\, dt$

Mathematics can appear in section heads. Note that mathematics in section heads may cause difficulties in tyepsetting styles with running headers or table of contents entries.

Theorems, Lemmata, and Other Theorem-like Environments

A number of theorem-like environments are available. The following lemma is a well-known fact on differentiation of asymptotic expansions of analytic functions.

Lemma *Let $f(z)$ be an analytic function in C_+. If $f(z)$ admits the representation*

$$f(z) = a_0 + \frac{a_1}{z} + o\left(\frac{1}{z}\right),$$

for $z \to \infty$ inside a cone $\Gamma_\varepsilon = \{z \in \mathrm{C}_+ : 0 < \varepsilon \le \arg z \le \pi - \varepsilon\}$ then

$$a_1 = -\lim z^2 f'(z), z \to \infty, z \in \Gamma_\varepsilon. \tag{2}$$

Proof Change z for $1/z$. Then $\Gamma_\varepsilon \to \overline{\Gamma}_\varepsilon = \{z \in \mathrm{C}_- : \bar{z} \in \Gamma_\varepsilon\}$ and

$$f(1/z) = a_0 + a_1 z + o(z). \tag{3}$$

Fix $z \in \overline{\Gamma}_\varepsilon$, and let $C_r(z) = \{\lambda \in \mathbf{C}_- : |\lambda - z| = r\}$ be a circle with radius $r = |z| \sin \varepsilon / 2$. It follows from (3) that

$$\frac{1}{2\pi i} \int_{C_r(z)} \frac{f(\lambda)d\lambda}{(\lambda - z)^2} = \sum_{m=0}^{1} a_m \frac{1}{2\pi i} \int_{C_r(z)} \frac{(\lambda - z_0)^m d\lambda}{(\lambda - z)^2} + R(z), \tag{4}$$

where for the remainder $R(z)$ we have

$$|R(z)| \le r^{-1} \max_{\lambda \in C_r(z)} o(|z|) = r^{-1} \max_{\lambda \in C_r(z)} |\lambda| \cdot O(|z| + r)$$

$$= \frac{|z| + r}{r} \cdot O(|z| + r) = \frac{1 + \sin \varepsilon}{\sin \varepsilon} \cdot O(|z|).$$

Therefore $R(z) \to 0$ as $z \to \infty, z \in \overline{\Gamma}_{\varepsilon/2}$, and hence by the Cauchy theorem (4) implies

$$\frac{d}{dz} f(1/z) = a_1 + R(z) \to a_1, \text{ as } z \to \infty, z \in \overline{\Gamma}_{\varepsilon/2},$$

that implies (2) by substituting $1/z$ back for z.

Section Headings

Use the Section tag for major sections, such as the one just above. Four additional heading levels are available, as described below.

Subsection Heading 2

This is some text.

Subsubsection Heading 3

This is some text.

Subsubsubsection Heading 4

This is some text.

Subsubsubsubsection Heading 5

This is some text.

Tags

You can apply the logical markup tag Emphasized and ***Strongly Emphasized***.

You can apply the visual markup tags **Bold**, *Italics*, **Keyboard Input, Sample Text**, and `Typewriter`.

You can apply the size tags Bigger and smaller.

Following is a group of paragraphs marked as Short Quote. This environment is appropriate for a short quotation or a sequence of short quotations.

The only thing we have to fear is fear itself*.* Franklin D. Roosevelt, ***Mar. 4, 1933***

Ask not what your country can do for you*; **ask what you can do for your country***.
John F. Kennedy, ***Jan. 20. 1961***

There is nothing wrong with America that cannot be cured by what is right with America*.* William J. "Bill" Clinton, ***Jan. 21, 1993***

Lists

Bullet, numbered and description list environments are available. Lists, which can extend four levels deep, look like this:

You can create numbered, bulleted, and description lists using the tag popup at the bottom left of the screen.

1. Numbered list item 1
2. Numbered list item 2
   a. A numbered list item under a list item.

      The typeset style for this level is often different from the screen style. The typeset appearance often uses parentheses around the level indicator.
   b. Another numbered list item under a list item.
      i. Third level list item under a list item.
         a. Fourth and final level of numbered list items allowed.

- Bullet item 1
- Bullet item 2
  - Second level bullet item.
    - Third level bullet item.
      - Fourth and final level bullet item.

Description List Each description list item has a term followed by the description of that term. Double click the term box to enter the term, or to change it.

Bunyip Mythical beast of Australian Aboriginal legends.