

# The Title of a Standard LaTeX Article using the Harvard Bibliography System

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## Abstract

We study the effects of warm water on the local penguin population. The major finding is that it is extremely difficult to induce penguins to drink warm water. The success factor is approximately  $-e^{-i\pi} - 1$ .

## 1 Sample Mathematics and Text

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 bibliography and citations created using the Chicago BIB<sub>T</sub>E<sub>X</sub> bibliography style.

### 1.1 In-line and Displayed Mathematics

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

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

is displayed and automatically numbered as equation 1.

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  $n \rightarrow \infty$ ,  $a_{n,k} \rightarrow 0$  for each  $k$ , and  $\gamma_n = \sum_{k=0}^{\infty} (a_{n,k+1} - a_{n,k})^+ \rightarrow 0$ . 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 L<sub>A</sub>T<sub>E</sub>X 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 following 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.

## 1.2 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 typesetting styles with running headers or table of contents entries.

## 1.3 Theorems, Lemmata, and Other Theorem-like Environments

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

**Lemma 1** *Let  $f(z)$  be an analytic function in  $\mathbb{C}_+$ . If  $f(z)$  admits the representation*

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

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

$$a_1 = -\lim_{z \rightarrow \infty, z \in \Gamma_{\varepsilon}} z^2 f'(z), \quad (2)$$

**Proof.** Change  $z$  for  $1/z$ . Then  $\Gamma_{\varepsilon} \rightarrow \bar{\Gamma}_{\varepsilon} = \{z \in \mathbb{C}_- : \bar{z} \in \Gamma_{\varepsilon}\}$  and

$$f(1/z) = a_0 + a_1 z + o(z). \quad (3)$$

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

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

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

$$\begin{aligned} |R(z)| &\leq r^{-1} \max_{\lambda \in C_r(z)} o(|z|) = r^{-1} \max_{\lambda \in C_r(z)} |\lambda| \cdot O(|z| + r) \\ &= \frac{|z| + r}{r} \cdot O(|z| + r) = \frac{1 + \sin \varepsilon}{\sin \varepsilon} \cdot O(|z|). \end{aligned}$$

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

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

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

## 2 Section Headings

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

### 2.1 Subsection Heading

This text appears under a subsection heading.

#### 2.1.1 Subsubsection Heading

This text appears under a subsubsection heading.

**Subsubsubsection Heading** This text appears under a subsubsubsection heading.

**Subsubsubsubsection Heading** This text appears under a subsubsubsubsection heading.

### 2.2 Compiling a Bibliography

1. Save this document using a name of your choosing.
2. Choose Typeset, Compile.
3. Check Generate a Bibliography.
4. Choose OK.
5. Choose Typeset, Preview.

### 2.3 Citations in the Harvard System

The standard citation mechanism that is supported by the SW Insert, Field, Citation mechanism is the parenthetical citation form, using the LaTeX macro `\cite` and is as follows:

As (Pitson 1978) and (Kopka and Daly 1993, Annex B) describe . . .

#### 2.3.1 `\citeasnoun`

The Harvard package also supports using a citation as a noun using the LaTeX macro `\citeasnoun`. These mechanisms are not supported directly through the SW interface. They are entered as TeX fields. Here are some examples that you can copy and modify.

As Pitson (1978) and Lamport (1986, Annex B) describe . . .

### 2.3.2 `\possessivecite`

You can use the citation as a possessive noun phrase with the LaTeX macro `\possessivecite`. Multiple citations are not permitted.

Lamport's (1986) description of this feature is . . .

### 2.3.3 `\citeaffixed`

You can use the LaTeX macro `\citeaffixed` command to allow text to be affixed inside the beginning of the parenthesis of a parenthetical citation.

BibTeX manuals (e.g. Lamport 1986, Pitson 1978) describe . . .

## References

- Kopka, H. and Daly, P. W.: 1993, *A Guide to L<sup>A</sup>T<sub>E</sub>X: Document Preparation for Beginners and Advanced Users*, Addison-Wesley.
- Lamport, L.: 1986, *L<sup>A</sup>T<sub>E</sub>X: A Document Preparation System*, Addison-Wesley.
- Pitson, J.: 1978, *Style Manual for authors editors and printers of Australian government publications*, 3rd edn, Australian Government Publishing Service, Canberra.