

# The Title of a Scientific Article or Report

A. U. Thor

The University of Stewart Island

**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  $-e^{-i\pi} - 1$ .

## In-line and Displayed Mathematics

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

$$\sum_{i=1}^{\infty} a_i \quad \#$$

is displayed and automatically numbered as equation ref: one.

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  $T$  cite: dunford.

Two sets of 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.

## 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  $z \rightarrow \infty$  inside a cone  $\Gamma_\varepsilon = \{z \in C_+ : 0 < \varepsilon \leq \arg z \leq \pi - \varepsilon\}$  then

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

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

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

Fix  $z \in \bar{\Gamma}_\varepsilon$ , and let  $C_r(z) = \{\lambda \in C_- : |\lambda - z| = r\}$  be a circle with radius

$r = |z| \sin \varepsilon/2$ . It follows from (ref: lemma3) that

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

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 (ref: lemma4) 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 (ref: lemma2) by substituting  $1/z$  back for  $z$ .

## 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.

## Heading 2

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

### Heading 3

This is some text.

### Heading 4

This is some text.

### 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 `typed code`.

You can apply the size tags smaller and **bigger**.

Following is a group of paragraphs marked as Block 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.