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# CMAM SAMPLE[1]

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**Abstract.** This paper is a sample prepared to illustrate the use of the Computaional Methods in Applied Mathematics LaTeX 2$_\varepsilon$ document class `cmam` and publication-specific variants of that class for LaTeX 2$_\varepsilon$.

**2000 Mathematics Subject Classification:** 65N20; 65M25.

**Key words:** sloshing of a liquid, singular integral equations, the Cayley transform, the collocation method.

## This is an unnumbered first-level section head

This is an example of an unnumbered first-level heading[2].

## 1. This is a numbered first-level section head

This is an example of a numbered first-level heading.

### 1.1. This is a numbered second-level section head

This is an example of a numbered second-level heading.

### This is an unnumbered second-level section head

This is an example of an unnumbered second-level heading.

#### *1.1.1. This is a numbered third-level section head*

This is an example of a numbered third-level heading.

[1]This sample and file cmam.cls are available on http://www.cmam.net/

[2]Here is an example of a footnote. Notice that this footnote text is running on so that it can stand as an example of how a footnote with separate paragraphs should be written.

And here is the beginning of the second paragraph.

### *This is an unnumbered third-level section head*

This is an example of an unnumbered third-level heading.

**Lemma 1.1.** *Let $f, g \in A(X)$ and let $E$, $F$ be cozero sets in $X$.*

1. *If $f$ is $E$-regular and $F \subseteq E$, then $f$ is $F$-regular.*
2. *If $f$ is $E$-regular and $F$-regular, then $f$ is $E \cup F$-regular.*
3. *If $f(x) \geq c > 0$ for all $x \in E$, then $f$ is $E$-regular.*

The following is an example of a proof.

*Proof.* Set $j(\nu) = \max(I \backslash a(\nu)) - 1$. Then we have

$$\sum_{i \notin a(\nu)} t_i \sim t_{j(\nu)+1} = \prod_{j=0}^{j(\nu)} (t_{j+1}/t_j).$$

Hence we have

$$\begin{aligned} \prod_{\nu} \Big( \sum_{i \notin a(\nu)} t_i \Big)^{|a(\nu-1)|-|a(\nu)|} &\sim \prod_{\nu} \prod_{j=0}^{j(\nu)} (t_{j+1}/t_j)^{|a(\nu-1)|-|a(\nu)|} \\ &= \prod_{j \geq 0} (t_{j+1}/t_j)^{\sum_{j(\nu) \geq j} (|a(\nu-1)|-|a(\nu)|)}. \end{aligned} \tag{1.1}$$

By definition, we have $a(\nu(j)) \supset c(j)$. Hence, $|c(j)| = n - j$ implies (5.4). If $c(j) \notin a$, $a(\nu(j))c(j)$ and hence we have (5.5). □

> This is an example of an 'extract'. The magnetization $M_0$ of the Ising model is related to the local state probability $P(a) : M_0 = P(1) - P(-1)$. The equivalences are shown in Table 1.

Table 1.

| | $-\infty$ | $+\infty$ |
|---|---|---|
| $f_+(x,k)$ | $e^{\sqrt{-1}kx} + s_{12}(k)e^{-\sqrt{-1}kx}$ | $s_{11}(k)e^{\sqrt{-1}kx}$ |
| $f_-(x,k)$ | $s_{22}(k)e^{-\sqrt{-1}kx}$ | $e^{-\sqrt{-1}kx} + s_{21}(k)e^{\sqrt{-1}kx}$ |

**Definition 1.1.** *This is an example of a 'definition' element. For $f \in A(X)$, we define*

$$\mathcal{Z}(f) = \{E \in Z[X] : f \textit{ is } E^c\textit{-regular}\}. \tag{1.2}$$

**Remark 1.1.** *This is an example of a 'remark' element. For $f \in A(X)$, we define*

$$\mathcal{Z}(f) = \{E \in Z[X] : f \textit{ is } E^c\textit{-regular}\}. \tag{1.3}$$

**Example 1.1.** *This is an example of an 'example' element. For $f \in A(X)$, we define*

$$\mathcal{Z}(f) = \{E \in Z[X] : f \textit{ is } E^c\textit{-regular}\}. \tag{1.4}$$

The following is an example of a numbered list.

1. First item. In the case where in $G$ there is a sequence of subgroups

$$G = G_0, G_1, G_2, \ldots, G_k = e$$

such that each is an invariant subgroup of $G_i$.

2. Second item. Its action on an arbitrary element $X = \lambda^\alpha X_\alpha$ has the form

$$[e^\alpha X_\alpha, X] = e^\alpha \lambda^\beta [X_\alpha X_\beta] = e^\alpha c^\gamma_{\alpha\beta} \lambda^\beta X_\gamma, \tag{1.5}$$

   (a) First subitem.

$$-2\psi_2(e) = c^\delta_{\alpha\gamma} c^\gamma_{\beta\delta} e^\alpha e^\beta.$$

   (b) Second subitem.

      i. First subsubitem. In the case where in $G$ there is a sequence of subgroups

$$G = G_0, G_1, G_2, \ldots, G_k = e$$

      such that each subgroup $G_{i+1}$ is an invariant subgroup of $G_i$ and each quotient group $G_{i+1}/G_i$ is abelian, the group $G$ is called *solvable*.

      ii. Second subsubitem.

   (c) Third subitem.

3. Third item.

Here is an example of a cite. See [6].

**Theorem 1.1.** *This is an example of a theorem.*

**Theorem 1.2 (Marcus Theorem).** *This is an example of a theorem with a parenthetical note in the heading.*

**Theorem 1.3 [1].** *This is an example of a theorem with a cite in the heading.*

**Proposition 1.1.** *This is an example of a proposition.*

**Corollary 1.1.** *This is an example of a corollary.*

## 2. Graphics

Graphics may be submitted to the CMAM in an electronic format. The CMAM recommends that graphics created electronically be saved in Encapsulated PostScript (EPS) format. This includes graphics originated via a graphics application as well as scanned photographs or other computer-generated images.

Note that figures and tables created with the LaTeX 2$_\varepsilon$ figure or table environments do **not** need to be submitted separately from the LaTeX 2$_\varepsilon$ file.

Many popular graphics applications under a Macintosh, Windows, or Unix environment allow files to be saved in EPS format. However, if your package does not support EPS output, save your graphics file in one of the standard graphics formats — such as TIFF,

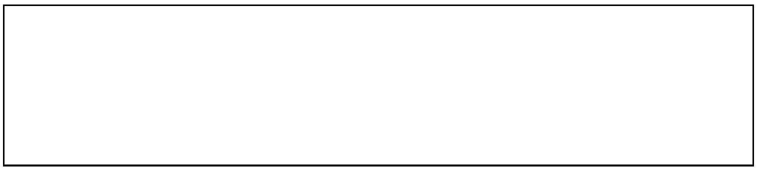

Figure 1. This is an example of a figure caption with text.

Figure 2.

PICT, GIF, etc. — rather than in an application-dependent format. For example, if you are using SuperPaint on a Macintosh, do not send files in SuperPaint format. Instead, save the file in PICT format from SuperPaint and send the PICT files to the CMAM. Graphics files submitted in an application-dependent format are not likely to be used. No matter what method was used to produce the graphic, it is necessary to provide a paper copy to the CMAM.

Ideally, text included in graphics files should be font outlines rather than bitmaps.

## 3. Some more list types

This is an example of a bulleted list.

- $\mathcal{J}_g$ of dimension $3g-3$;
- $\mathcal{E}_g^2 = \{$Pryms of double covers of $C = \square$ with normalization of $C$ hyperelliptic of genus $g-1\}$ of dimension $2g$;
- $\mathcal{E}_{1,g-1}^2 = \{$Pryms of double covers of $C = \square_{P^1}^{H}$ with $H$ hyperelliptic of genus $g-2\}$ of dimension $2g-1$;
- $\mathcal{P}_{t,g-t}^2$ for $2 \le t \le g/2 = \{$Pryms of double covers of $C = \square_{C''}^{C'}$ with $g(C') = t-1$ and $g(C'') = g-t-1\}$ of dimension $3g-4$.

This is an example of a 'description' list.

**Zero case** $\rho(\Phi) = \{0\}$.

**Rational case** $\rho(\Phi) \neq \{0\}$ and $\rho(\Phi)$ is contained in a line through 0 with rational slope.

**Irrational case** $\rho(\Phi) \neq \{0\}$ and $\rho(\Phi)$ is contained in a line through 0 with irrational slope.

## 4. Bibliography and BibTeX

If using BibTeX, authors need not submit the .bib file for their papers. Merely submit the completed .bbl file, having used cmam.bst as their bibliographic style file.

If not using BibTeX, CMAM bibliographic references follow the format of the following examples:

## References

[1] R. A. Brualdi and B. L. Shader, *On sign-nonsingular matrices and the conversion of the permanent into the determinant*, in: *Applied Geometry and Discrete Mathematics, The Victor Klee Festschrift* (P. Gritzmann and B. Sturmfels, eds.), American Mathematical Society, Providence, RI, 1991, pp. 117–134.

[2] R. S. Dembo, S. C. Eisenstat, and T. Steihaug, *Inexact Newton methods*, SIAM J. Numer. Anal., **19** (1982), no. 5, pp. 400–408.

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[4] P. M. Gibson, *Conversion of the permanent into the determinant*, Proc. Amer. Math. Soc., **27** (1972), no. 4, pp. 471–476.

[5] G. H. Golub and C. F. Van Loan, *Matrix Computations*, 2nd edn., The Johns Hopkins University Press, Baltimore, MD, 1989.

[6] J. P., Drew, C. R. Johnson, and van den Driessche, *Strong forms of nonsingularity*, 2001, Linear Algebra Appl.

Other types of references fall into the same general pattern.

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