

MATH 1C03: Introduction to Mathematical Reasoning

Research in Mathematics

PRESENTED BY

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I. Researching in Mathematics

1. Steps in Researching a Topic

- a) Get background information from handbooks, encyclopedias, dictionaries
Note any synonyms that can be used in searching further
Note any specific aspect of your topic in order to narrow your topic
Note any references to search in the Library Catalogue
- b) Find books on your topic to gain greater depth and understanding
Note any synonyms that can be used in searching further
Note any specific aspect of your topic in order to narrow your topic further
Note any references to search in the Library Catalogue
- c) Once your topic is narrowly defined, select databases to find specific articles that have been published in journals
- d) Write down or store all the references you have consulted to include them in your bibliography of your research paper (e.g., Refworks)

2. Finding Resources

Encyclopedias, handbooks, dictionaries

McGraw-Hill Encyclopedia of Science and Technology 20 v. (Thode Ref. Q 121 M3)

Encyclopaedia of Mathematics (Thode Ref. QA 5 .M3713)

Dictionary of Scientific Biography 18 vols. (Thode Ref. Q 141 D 5)

Search Library Catalogue; use “in Subject” index

mathematics encyclopedias

mathematicians biography

scientists biography dictionaries

Books

Search Library Catalogue; use “in Subject” index

fermats last theorem

Databases: these are resources to locate articles published in journals, conference proceedings, etc., on a particular topic

There are **general science databases:**

Science Citation Index Expanded (Web of Science)

and **subject specific databases**

Mathematics

Jahrbuch über die Fortschritte der Mathematik (1868-1942)

<http://ftp.gwdg.de/pub/misc/EMIS/projects/JFM/>

MathSciNet
Statistical Theory and Method Abstracts –
Zentralblatt (STMA-Z)
Zentralblatt für Mathematik und Ihre Grenzgebiete
THODE 2nd floor, ZQA 1 Z4 – 1931-1995)

Mathematical Physics/Physics Inspec (Engineering Village 2)

Search Library Catalogue:

- by the title of the database “in Title” index:
 - e.g. mathscinet
- by subject “in Subject” index:
 - e.g. mathematics indexes
- browse "Find Articles" for other databases

II. Types of scientific literature

1. *scholarly versus popular*

a) types of scholarly:

primary/original

- journal articles
- conference papers
- pre-prints on arXiv
- dissertations/theses

secondary

- review articles
- books (monographs)
- encyclopedias/handbooks/dictionaries

tertiary

- databases (indexes/abstracts)
- bibliographies
- guide to literature

b. popular

- magazines
- newspapers
- blogs
- Facebook/Second Life
- Wikipedia

2. *Characteristics of scholarly journal articles*

- a) prior to publication, articles are subjected to the peer-reviewed process; in

other words, they are refereed by researchers in the field at hand (peers) with regard to quality and importance of contribution on published articles indicated with

"received on...";

"accepted for publication on..."

Sources for determining peer-reviewed journal articles:

Section on "Information to authors" in the journal

Ulrichsweb – accessible through Library Catalogue

- b) research aimed at specific groups; if research is new, articles are referred to as primary or original; if evaluation/analysis/state of the art of research is presented, articles are referred to as review articles, which are scholarly, but not original/primary
- c) follow particular format (abstract, introduction, methods, discussion, conclusion)
- d) references
- e) acknowledgement (for financial support, technical assistance, personal assistance)
- f) affiliation/credentials

3. Evaluating Print and Web Resources¹

Similar criteria apply to print and web resources:

- a) Authority:** authors' names, indication of credentials, such as occupation, degree, institution (commercial versus educational)
- b) Content:** can the subject matter be quickly determined?
research, opinion, fact, bias, advertisement
are statements/claims verifiable through listed references
popular, academic/scholarly, technical, clinical
comprehensive, selective, overview
- c) Currency:** date of publication
date of update (new edition for print)

III. References/Citations

1. Reasons for References/Citations

Whenever you use information that is not your own whether in print or from the web, you have to give the source where you found it. This is referred to as Citations or References or Bibliography (last being arranged alphabetically by author).

Sources are cited in order:

- a) to acknowledge the work of others
- b) to allow readers to obtain full reference
- c) to show development of an idea

2. *Citation Styles*

The basic elements of a citation include:

For a book: Author(s)

Title of book

Edition (if given)

Place of publication : Publisher, year of publication

Fleischner, H. **Eulerian Graphs and Related Topics.**

Amsterdam ; New York : North-Holland, 1990.

For an article: Author(s)

Title of article

Title of journal, year, volume no., pages

Arthur, J. Parabolic Transfer for Real Groups. **J Am. Math. Soc.**

2008 **21** (1): 171-234

3. *Resources on citation styles*

Chicago-Style Citation Quick Guide

http://www.chicagomanualofstyle.org/tools_citationguide.html

Council of Biology Editors (CBE) Style of Documentation in Science and

Mathematics <http://www.monroecc.edu/depts/library/cbe.htm>

How to Cite Your Sources in Chicago Style: Documentation Type Author-Date System / Bailey/Howe Library Reference

<http://library.uvm.edu/guides/cite/handouts/ChicagoScientific.pdf>

MRef / American Mathematical Society

<http://www.ams.org/mref>

This site will reformat a reference according to the style used in MathSciNet

IV. Guides to Writing in Mathematics

Handbook of Writing for the Mathematical Sciences

Thode Bookstacks: QA 42. H54 1993

Guide to specific requirements in the writing of mathematics, stylistic and grammatical usage

Mathematical publishing: a Guidebook

Thode Reference QA 42 .K727 2005

Guide to publishing in books, journals and to copyright issues

- ¹Greenwood, A. "Criteria for Evaluating Print Resources", University of British Columbia Library. <http://www.library.ubc.ca/scieng/PrintEval.html> <viewed 20 October 2008>
Greenwood, A. "Criteria for Evaluating Internet Resources", University of British Columbia Library <http://www.library.ubc.ca/home/evaluating/> <viewed 20 October 2008>

