Open Textbooks

From an Author's Perspective

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The Problem: Textbooks Today

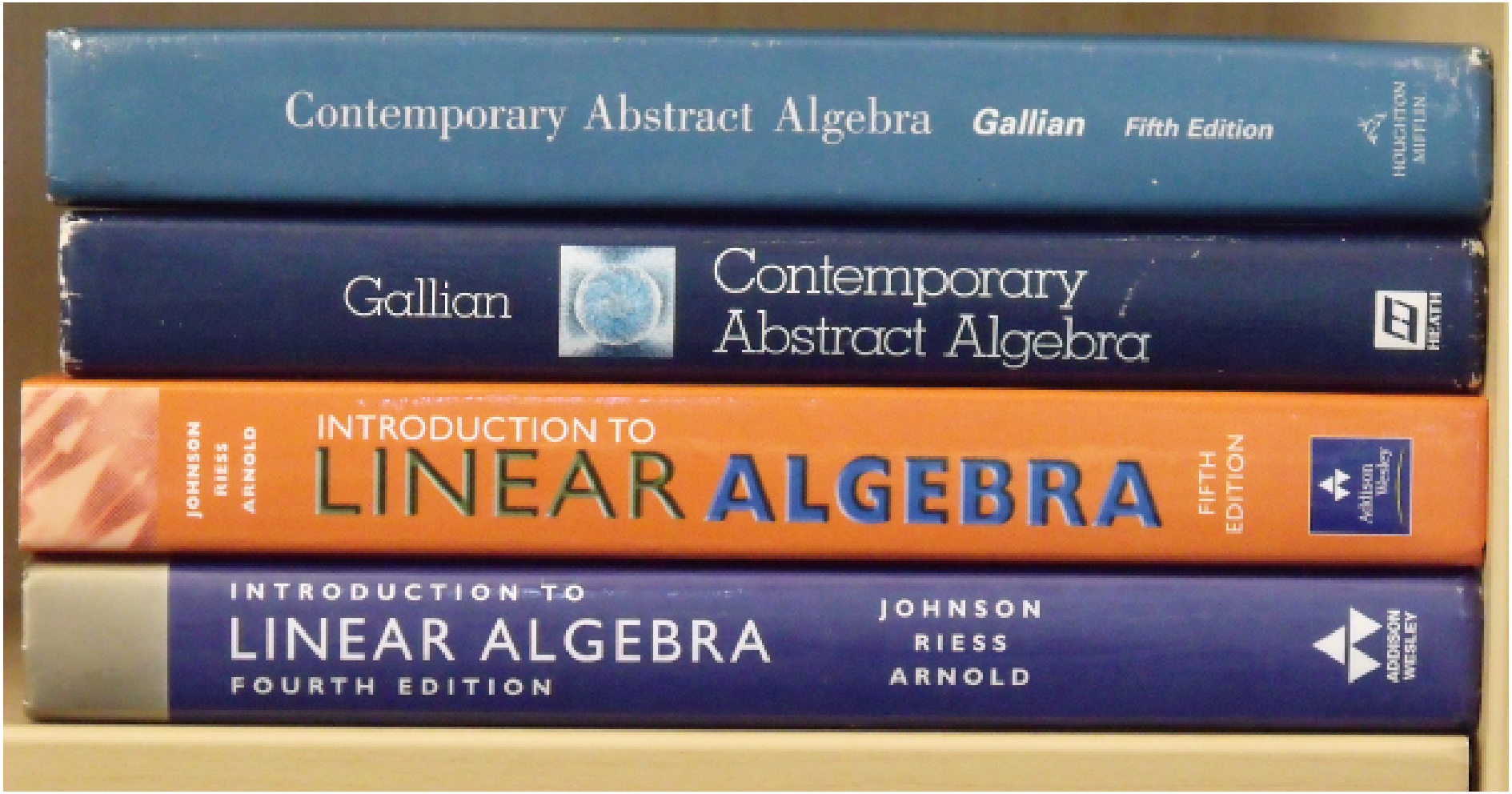
- Textbooks are too expensive
- Frivolous new editions are disruptive
- Publishers consolidate and worthwhile books go out of print
- Content designed for widest possible audience

Commercial interests have been given too much influence.

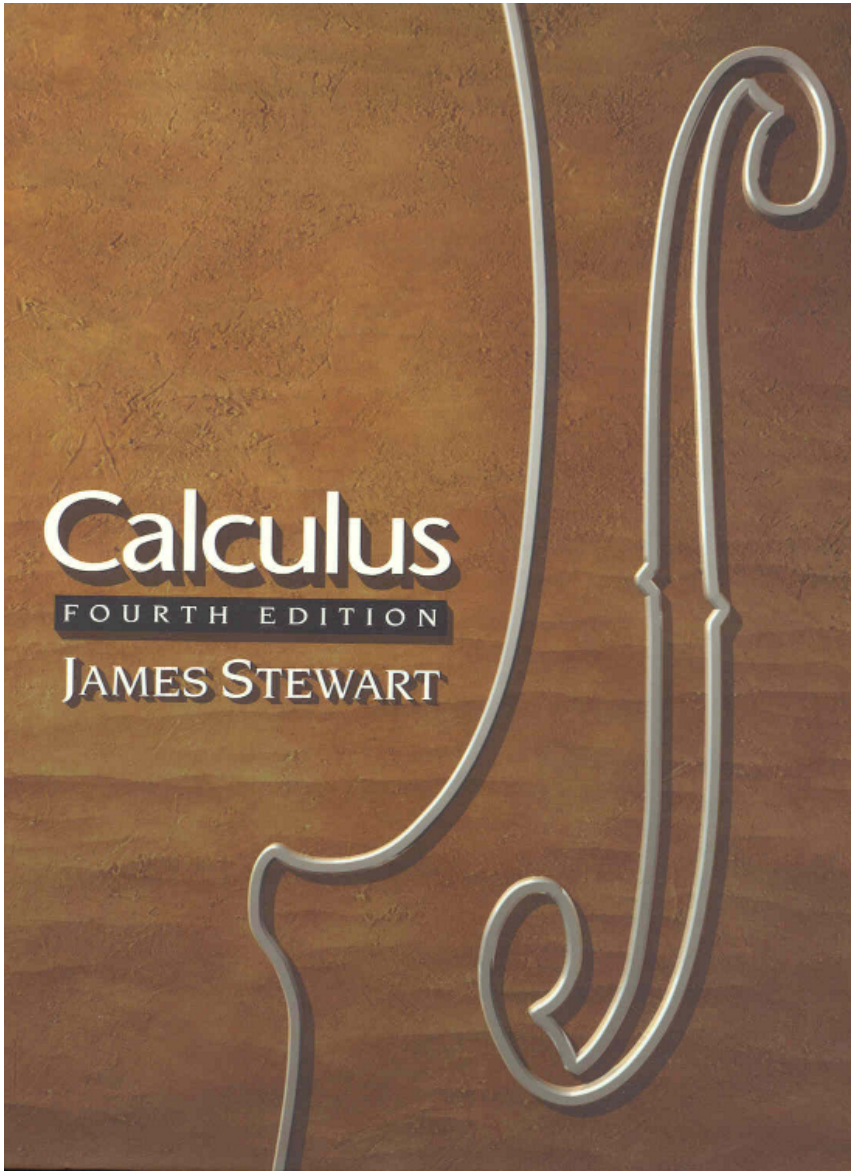
My Bookshelf

Thirty books with enough content to make five.

My Bookshelf



Linear Algebra: 1st Edition, 1981. 6th Edition, List: \$145.33
Abstract Algebra: 1st Edition, 1984. 7th Edition, List: \$169.95



Stewart's mansion in Toronto
18,000 ft^2, \$24 million

6th Edition, List: \$213.95

A Solution: Open Textbooks

- Free download, or very inexpensive to print
- New editions have new content
- Never go out-of-print
- Intellectually honest approach to a subject

Open textbooks allow a return to a free exchange of ideas.

My Bookshelf

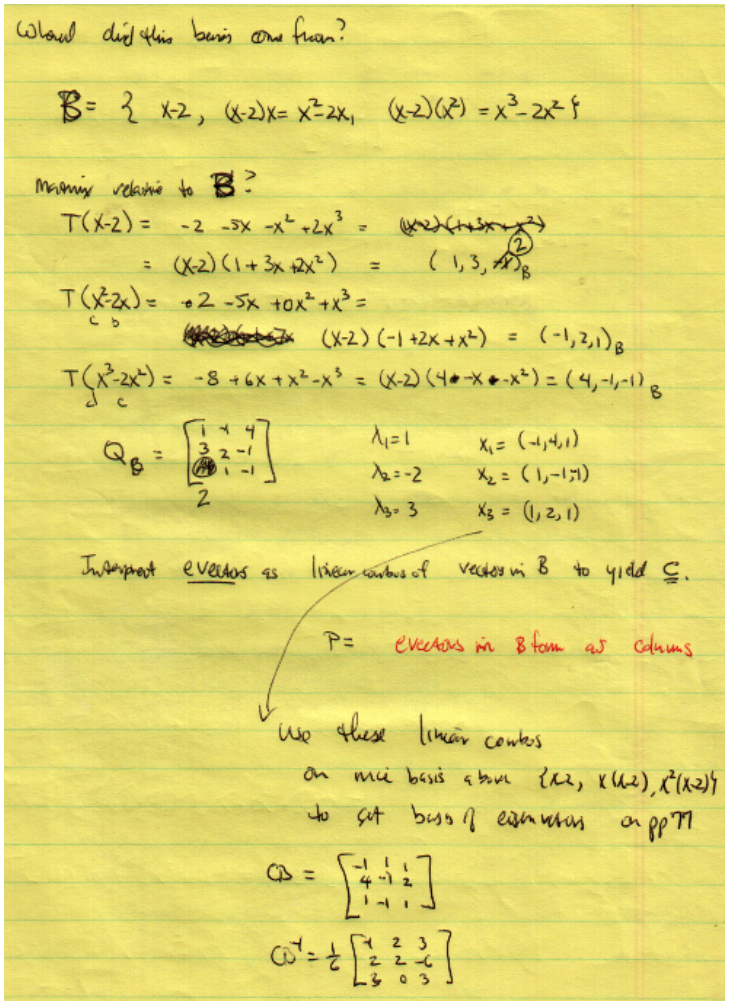
Can you spot the open textbook?

My Bookshelf

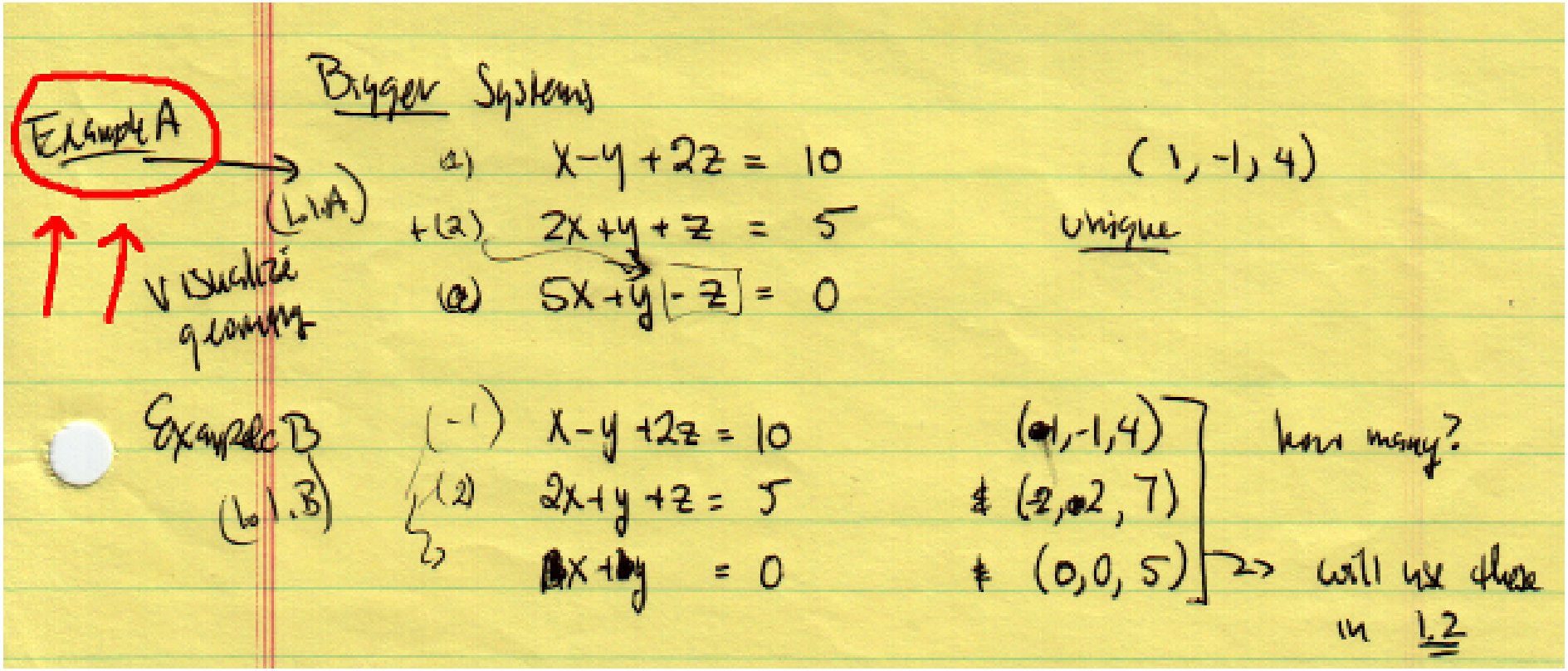
Can you spot the open textbook?

Birth of a Text

Why does one decide to write a textbook?



Birth of a Text



Adolescence

- Spring 2004: Half of a semester's sabbatical
- Wrote half of the narrative
- August 2004: Website debuts
- Fall 2004 Semester: wrote second half of narrative
- December 2004: Open license, TEX source available
- Taught the course frequently in subsequent semesters

Age of Majority

- December 2006
- Online MathML/XML version
- Version 1.00
- Print-on-demand available at Lulu.com

Early Adulthood

- Spring 2007: Advanced Topics course, new chapters
- Two students write sections
- Frequent corrections from readers worldwide
- In use at...
  - Smith College
  - Amherst College
  - Pacific University
  - U of Colorado
  - U of Western Australia
  - Central Washington U
  - Miramar College
  - Wilbur Wright College
  - Moorpark College

"A Dizzying Array of Formats" — Textbook Revolution

Two major editions, nine minor revisions (semesters), countless updates
Automated construction from one source:

- Archive (zip, tar) with LaTeX source
- PDFs for download
  - A4 and Letter, 1-sided, 2-sided, "electronic"
  - Screen ratios, 4:3 and 16:9 widescreen
  - Sony Reader, Kindle DX
- MathML/XML (needs fonts), jsMath (fonts on server)
- Flashcards of definitions and theorems, supplements
- Detailed change log
- Planned: Sage worksheets

Eleven revisions, plus recent updates, always available

Distribution

- Print on Demand at Lulu.com
- Amazon Honor System donations (broken)
- Website
  - `linear.pugetsound.edu`
  - 500,000 page views ($\sim$ 250,000 visitors)
  - Worldwide audience (`statcounter.com`)
  - #6 for Google "linear algebra" search
- RSS feed (with PDF enclosure)
- Twitter: @FCLAbook, 23 followers
- Discussion group on Google Groups: fcla-discuss

Advantages

- Free download
- Print copies, 900 pages, softcover at ∼$30
- The book has its own freedom (having reached the age of majority)
- Never goes out of print
- Old editions always available
- Extremely customizable
  - Remove chapters, exercises
  - Solutions in each section, or all in the back
  - Notation: A^t versus $\overline{A}$
  - Example: Nancy Neudauer, Pacific U
- Hyperlinks from proofs to previous theorems
- MathML/XML readable for blind

Choosing a License

- GNU Free Documentation License (GFDL)
  - Free to copy, modify, distribute
  - Modify and distribute, then must use GFDL
  - Same license as Wikipedia
- Creative Commons
  - BY, SA, NC
  - NC makes Judson on Amazon impossible
  - NC makes FlatWorld Knowledge possible
- Threat of a "fork" keeps authors honest
- Possibility of a fork gives faculty and students assurances

The License is Important

Thomas S. Shores, *Linear Algebra and Applications Textbook* Website, July 29, 2009:

> *In order to enable prospective users to preview my text easily and conveniently, in the past I have put a copy of it on the web for your perusal. In the last few years I've received many helpful comments and appreciative notes for having done so. I would like to thank those of you who sent me these notes and comments. You have helped me substantially improve the text. I am now under contract with Springer-Verlag and the book has been published in their Undergraduate Texts in Mathematics series in hardbound and, more recently, soft cover editions. Therefore, I have removed the on-line copy.*

Demonstration

Download a PDF version
View the online jsMath version
`http://linear.pugetsound.edu`

Frequently Asked Questions

- Is it an online course?
  - No, it is a "real" book, distributed online.
- (Upon seeing physical copy) Oh, it is a real book!?
  - Yep, it is a real book, only better.
- Do you have a publisher yet?
  - I am the publisher.
- Have you finished?
  - Never.
- How many deadlines have you missed?
  - None.
- Is it copyrighted?
  - Yes, do you understand copyleft?
- That's very admirable, but don't you want to make money?
  - Yes, I'm trying.
- That's very admirable, but couldn't you make lots of money?
  - Doubtful.
- That's very admirable, have you made much money?
  - No, not really, but I do receive donations (and lots of great email).

Adopting an Open Source Text

- PIRG's Affordable Textbook Campaign
  - "Open Textbooks Statement of Intent"
  - 2,000 signatures
- There was no decent, truly free, abstract algebra textbook
- Tom Judson's "Abstract Algebra; Theory and Applications"
- Original publisher: PWS-Kent, 1992
  - Bought by Wadsworth
  - Bought by Thomson
  - Sold off as Cenage Learning
- Two fortunate circumstances
  - Copyright was returned to Judson (he has a letter)
  - Book was written in LaTeX, PDF production was trivial

Quick Acceptance

- Website debuts February 2009
- `abstract.pugetsound.edu`
- LaTeX source, PDF close to original
- 17,000 visitors
- In use at seven schools this fall
  - U of Portland
  - U Puget Sound
  - Berkeley
  - Grinnell College
  - Drexel U
  - Virginia Commonwealth U
  - Boston College
- Available on `amazon.com` via the Virginia Commonwealth series
  - $25 hardback, delivered in 4 business days

Conclusion: The Two-Minute Elevator Speech

- Copyright is a government-granted monopoly
- This allows me to use a license granting extra freedoms
- FREE
- No spurious editions, no out-of-print
- Flexible: copy, modify, chop, extend, hack, remix

Posted at `http://buzzard.pugetsound.edu/talks.html`