

## Math in Our World, 4e

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ISBN: 125996969X / 9781259969690

### Global Changes

- As the quantitative reasoning movement has gained steam nationwide, the main goal of this revision was to emphasize the critical thinking and discovery learning typified by QR while maintaining the traditional format of a liberal arts math book. This was addressed in several ways. Many solved examples were replaced or rewritten to encourage more thinking and less computing, as were many Try This One questions. There's more emphasis on appropriate use of technology, both spreadsheets and calculators, freeing instructors and students to focus on interpretation and application. The critical thinking exercises have also been expanded. Finally, a new category of exercise was added in several sections: Using Technology. These are questions specifically designed for students to create spreadsheets to aid in solving interesting problems.
- I've always tried to base as many applications as possible on real, current data. That's a good thing. The downside is having to update or replace all of the problems with each revision. It's a lot of work, but well worth it, especially for information age students, many of whom feel like anything that happened before 2012 is ancient history.
- As always, I reevaluated every single passage in the book, looking for opportunities to improve readability and tone. I also tried to add a little more humor this time around—learning is supposed to be fun, right?
- Next is a list of some chapter-specific changes. Note that when listing the number of “improved” example questions, I'm not talking about simple rewording, or updating data. These are problems that were significantly improved, in most cases by adding a further critical thinking element.

### Chapter by Chapter Changes

#### Chapter 1 Problem Solving

- Chapter opener was updated with new questions.
- The section on estimation was revamped to put emphasis on when an estimate is an overestimate or underestimate, and when each would be desirable.
- Four totally new examples, and seven improved examples

## Chapter 2 Sets Theory

- Sometimes example problems using abstract sets are the simplest way to introduce procedures and concepts, but I made an effort to minimize the number of abstract examples.
- Cartesian product was moved from a topic in lesson 2-2 to a series of discovery questions in the Critical Thinking exercises.
- Three totally new examples, and 10 improved examples

## Chapter 3 Logic

- In general this chapter needs far less updating when shooting for more reasoning, as of course the entire chapter is all about logical reasoning. The most significant change is a new feature that illustrates a technique for simplifying complicated truth tables: students are encouraged to cover up all but the relevant columns at each stage with strips of paper, and this is graphically reflected in solved examples.
- Two totally new examples, and three improved examples

## Chapter 4 Numeration Systems

- New chapter opener on computer graphics and base number systems
- When studying the history of numeration systems, more emphasis is put on comparing the efficiency of different types of systems.
- One totally new example, and three improved examples

## Chapter 5 The Real Number System

- I feel like this chapter already had a pretty good emphasis on a deeper understanding of the real number system, so less updates were made than typical.
- Four totally new examples, and four improved examples

## Chapter 6 Topics in Algebra

- This represents a major change in content and organization. The algebra review portion of *Math in Our World* used to span both Chapters 6 and 7. This has been streamlined into a single chapter. The algebraic topics that are most likely to be needed for other chapters in the book were left in the print version, with the remaining content shifted to an online algebra review supplement.
- One totally new example, and two improved examples

## Chapter 7 Consumer Math

- The most obvious change is a completely new section on personal budgeting.
- The coverage of converting percentages between formats was streamlined.
- As financial calculations get more complicated, optional spreadsheet calculators have been created to allow students to save time on number crunching. These are available in instructor resources and can be shared with students if so desired.
- In the coverage of student loans, the difference between capitalized and non-capitalized interest has been clarified.
- Two new Sidelights have been added, one on retirement savings and another that studies how much of a mortgage payment goes directly to interest based on the age of the loan.
- The coverage of stock tables has been completely revamped to reflect the information that is most typically available in modern online stock listings.
- Coverage of stock splits has been added.
- Seven completely new examples, and seven improved examples

## Chapter 8 Measurement

- Improved coverage of dimensional analysis and conversion factors
- Three completely new examples

## Chapter 9 Geometry

- Chapter opener was updated with a recent use of geometry in my world.

- Substantial changes were made to coverage of perimeter, area, and volume, with more formulas developed in example problems, and less supplied. This chapter has some of the best examples of the new emphasis on reasoning and critical thinking (if I do say so myself).
- Seven totally new examples, and four improved examples

## Chapter 10 Probability and Counting Techniques

- In previous editions, counting techniques were covered first, making it pretty hard to motivate the topic. The basic concepts of probability now come first, and counting techniques are introduced as tools for helping to study probability.
- Eight totally new examples, and 10 improved examples; this chapter has MANY examples of the new emphasis on reasoning.

## Chapter 11 Statistics

- Chapter opener was expanded to include a third data set, allowing for further exploration of correlation.
- Coverage of bar graphs and pie charts refocused on when it's appropriate to use each type rather than just creating or reading graphs.
- Expanded and improved coverage of stem and leaf plots
- The section on measures of average has perhaps the best examples of the focus on reasoning. Far more attention is given to when particular measures are most appropriate, and when measures of average can be deceiving.
- More attention is given to contrasting descriptive and inferential statistics.
- A fun new sidelight on spurious correlations was added.
- Twelve completely new examples, and 11 improved examples

## Chapter 12 Voting Methods

- More focus on comparing results using different voting methods
- More focus on understanding what the standard divisor and standard quota really are, allowing for an easier understanding of apportionment methods
- New sidelight on Alexander Hamilton added.
- Two totally new examples, and seven improved examples

## Chapter 13 Graph Theory

- One totally new example, and eight improved examples

## Chapter 14 Other Mathematical Systems

- The study of other systems is so based on mental flexibility and thinking outside the base 10 box that I didn't feel many changes were useful.
- One totally new example

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