Introduction to a course in Math History

Contents

0 Introduction to a course in Math History 1
  0.1 Summary of the course .................................................. 1
  0.2 References ............................................................... 2
  0.3 Some secondary sources .............................................. 2

0 Introduction to a course in Math History

There is an old Armenian saying, “He who lacks a sense of the past is condemned to live in the narrow darkness of his own generation.”

Those who use mathematics in their profession benefit from understanding the evolution and development of mathematics. The process of discovery in mathematics is little understood by the public. Professionals who use mathematics – and this includes math teachers! – must be aware of process of discovery and validation of mathematical concepts.

Some one else has said: “Mathematics without history is mathematics stripped of its greatness: for, like the other arts – and mathematics is one of the supreme arts of civilization – it derives its grandeur from the fact of begin a human creation.” (G. F. Simmons, in Differential Equation with Applications and Historical notes, 1991, quoted in the November 1997 issue of the American Mathematical Monthly.)

“Perhaps the most surprising thing about mathematics is that it is so surprising. The rules which we make up at the beginning seem ordinary and inevitable, but it is impossible to foresee their consequences. These have only been found out by long study, extending over many centuries.” (Edward Charles Titchmarsh)

0.1 Summary of the course

We may (roughly) divide the timeline of mathematics history into six parts:

1. Before the Greeks (prehistory to about 500 BC.)

2. The Greeks and the first golden age of mathematics (500 BC to 450 AD)

3. The Quiet Millenium (450 AD to 1500; this includes the mathematics of Arabia, India, China and medieval Europe)

4. The Calculus Revolution and the second golden age of mathematics (1500 AD to 1800)

5. The Age of Uncertainty (nineteenth century)

6. The Twentieth Century and the third golden age of mathematics (1900 to the present)

The second, fourth and sixth parts have led to the most dramatic changes in mathematics. In this course will focus on the Greek golden age and then the mathematics of the scientific revolution. The math of the Greek golden age roughly parallels high school mathematics in the US; the math of the scientific revolution roughly parallels university mathematics.
0.2 References

There are several excellent sources for an introductory course in the history of mathematics.

1. A classical textbook is by [Howard Eves, An Introduction to the History of Mathematics, sixth edition, 1990](#). This is an exceptional book, often viewed as a standard for studying this subject. The problems in this book are famous; they provide insight to true problems faced by mathematicians of the times. But the problems are at times difficult for students in their sophomore or junior years in college. I have used this book as a textbook for undergraduates at both Central Michigan University and at Sam Houston State University. I give it five stars!

2. Another exceptional work (5 stars!) is the three volume set by Morris Kline Mathematical Thought, From Ancient to Modern Times, first edition, 1990. The first volume of three is [here at amazon.com](#) (I used this book as a textbook in graduate classes at Central Michigan University.)

3. The textbook for “The Evolution of Mathematics” (MTH 467) in spring 2011 at Sam Houston State University was [David Burton’s The History of Mathematics](#), seventh edition, 2010.

These books cover our six periods as follows:

1. **Before the Greeks**, prehistory to about 500 BC. (Burton, chapters 1 & 2, Eves, chapters 1 & 2, Kline, chapters 1 & 2)

2. **The Greeks and the first golden age of mathematics**, 500 BC to 450 AD. (Burton 3-5, Eves 3-6, Kline 3-8)

3. **The Quiet Millenium**, (450 AD to 1500, including the mathematics of Arabia, India, China and medieval Europe) (Burton sections 5.5 & 6.1 & chapter 7, Eves chapters 7-9, Kline chapter 9-14)


5. **The Age of Uncertainty**, the nineteenth century. (Burton 11-12, Eves 13-14, Kline 31-43)

6. **The Twentieth Century** and the third golden age of mathematics, 1900 to the present. (Burton 13, Eves 15, Kline 44-51)

0.3 Some secondary sources

1. [Ivor Grattan-Guiness, The Rainbow of Mathematics](#). An interesting book, but not as comprehensive as the other three.

2. [Constance Reid’s biography of Hilbert](#) This gives a wonderful view of mathematics at the beginning of the twentieth century. I highly recommend this book!

3. [Franklin Swetz (editor), From Five Fingers to Infinity](#) (Subtitled: A journey through the history of mathematics, Open Court Pub Co., 1st edition (1994).)

There are also number of webpages which are good sources for math history. I recommend:

4. The St. Andrews University (Scotland) [MacTutor website](#)

5. Don Allen’s [math history webpage](#) at Texas A & M.

6. Wikipedia’s article [on the history of mathematics](#)