History of Mathematics
Homework 1

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February 7, 2014

Preliminaries

Due Thursday

- Send me email (to `eb at cs dot umb dot edu`) from the email address you want me to use for the class mailing list.

- Complete the questionnaire at `http://www.cs.umb.edu/~eb/370/questionnaire.pdf` by editing and compiling the LaTeX source at `http://www.cs.umb.edu/~eb/370/questionnaire.tex`. Turn in hard copy of the pdf and the LaTeX source.

  Answering the questions is not hard. But I'm asking more than that. To answer them in the form I require you'll have to begin to learn TeX – in particular, LaTeX. That typesetting system is the best in the world for mathematics (and lots of other documents too) and well worth the (sometimes substantial) effort it may take you to learn it. If you go on in mathematics it may well be the most valuable thing you learn in this course.

  To use TeX you need two kinds of software on your computer. The first is a TeX *distribution*. You can find links to download one at `http://www.cs.umb.edu/~eb/370/tex`, where I have listed some TeX resources.

 The second is an editor. You can write TeX with any word processor. I use `emacs`. Even Microsoft Word or Notepad would do. But I recommend something like TexStudio (`http://http://texstudio.sourceforge.net/`), which is a complete environment for writing, compiling and previewing TeX documents.

  Once you get started you'll find it fun (I hope). You can ask me TeX questions, or ask them at `http://tex.stackexchange.com`.

Due next Tuesday. You'll have to read a fair amount of Euclid to do it. There's some in the book on pages 20-23 and lots more in the links at `http://www.cs.umb.edu/~eb/370/euclid`.

Exercises

1. Prove that in the Sacchieri quadrilateral [1] the angles at D and C are equal. (This is Exercise 1.3 in the text.)
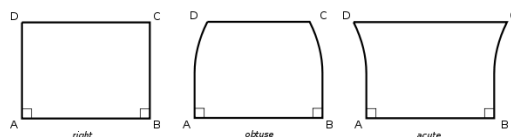
Write your proof in *Euclid's style*, with explicit references to the Definitions, Postulates, Common Notions and Propositions that justify each step. So your proof might begin this way:

Let $ABCD$ be a quadrilateral figure having right-angles at A and B with equal sides AD and BC. I say that the angles at D and C are equal. [2]

Draw the straight lines AC and BD [Postulate 1]. [3] ...

2. Prove that with the parallel postulate, C and D in Sacchieri's quadrilateral are right angles. This is Exercise 1.4 in the text. The hint there suggests using Proposition 27.

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[1] Image edited from wikipedia

[2] Euclid uses "I say that" where we might write "I must prove that".

[3] This is a hint about how you might begin. Use Euclid's Proposition 4 to prove that triangles DAB and CBA are equal (we would call them congruent).