

Math 130 Homework 1

Reading:

- Stillwell Chapter 1
- Reading for question 2 below
- Guide to the *Elements* at <http://aleph0.clarku.edu/~djoyce/elements/bookI/bookI.html#guide>

1. (Open ended question)

Describe, in a few paragraphs, what prior experience you have had with *geometry*, and what it was like. High school geometry? Did you take a mathematics class (or physics? or...?) here that involved some geometry? What *is* the kind of geometry that you have done? You may, but do not have to, address some of the following ideas in your answer:

What is the common theme in your experience? What makes geometry “geometry” and what distinguishes it from other types of mathematics? Where there things that you learned that surprised you? Had an impact on you (positive or negative)?

2. Read, carefully and thoughtfully, the review of the book *Geometry: Euclid and Beyond Euclid* posted on the class website. (Book by Hartshorne, review by Henderson. This book has been used in previous years for this class, and we will read excerpts from it.) Don't worry about understanding all the mathematical details – you are not required to know what a manifold is. But I want you to get the general idea.

Then answer the following questions with a short paragraph or two.

- (a) What is Henderson's main criticism of the text, and how does he support this claim?
- (b) What, according to Henderson, are the strongest features of the text?
- (c) What does Henderson consider geometry to be? Is this consistent with your experience of geometry as you described in Question 1? You may wish to describe what is missing from your experience or his description, what you'd like to learn, if you disagree with his classification of aspects of geometry, or his labeling of something as geometry, etc.

3. (Not to hand in, but we will discuss the game in class)

Play several levels of *Euclid: the game* at <http://euclidthegame.com>.

What do you think of it as a teaching/learning tool?

4. Do the following problems from Stillwell's *Four Pillars* (henceforth called S4P)

1.3.5, 1.3.6, 1.4.1, 1.4.2, 1.4.3, 1.4.4.

5. Construct the following with straightedge and compass. You need to explain the construction, then justify that it is what it claims to be. For the justification, you can use basic geometry facts (e.g. similar triangles) that we haven't proved yet, as long as you state the facts.

- (a) Given a circle with center O and a point A outside the circle, construct a tangent line to the circle passing through A .
- (b) Given a triangle, construct a circumscribed circle.