Assignment IV Math 592: Geometry and Proof
due Oct. 1

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September 25, 2007

Fall 2005

1. In Tarski's World: Read for Oct. 1 chapter 6.1-6.6 and and 7.1. Up to 6.6 there are 34 problems. There are 4 problems in section 7.1 Hand in on Oct. 1 a statement as to which of the first 33 and the 4 in 7.1 you have done and any questions you have. Feel free to e-mail me with questions jbaldwin@uic.edu or phone 312-413-2149 (although I am in and out of my office).

2. Hand in a written solution to problem 6.34 of Tarski's world.

3. Using the axioms we have developed (including SAS), write out a proof of SSS. (If the corresponding sides of two triangles are congruent, the triangles are congruent.)

4. Read from the paper by Harel and souder on the website. Read at least: episode 19 on page 35 concerning Mr(s) Smart and sections 1 and 2.

5. Read the commentary on Proposition 1.4 in Euclid's elements (on the web; url on our website; follow up as much as you are interested). Try googling Euclid Heath.

6. Last week we had the problem: You walk one mile south then a mile west then a mile north you are now back to the same place you started???? Where are you???? (Two part question: The usual understanding of this is that there is only on correct answer. Find it. In fact, there are infinitely many. What are the rest of them? (Hint. There is only one solution if I add the constraint: During the trip, you see a polar bear.)

Let me clarify for those who didn't solve the second part. On the earth there are infinitely many solutions to the problem without the seeing the polar bear. It is quite important that you will not see a polar bear although I could also have specified that you would not see a flamingo. That is, there is a constrained region in which you

can find do the previous problem (repeated below). So here is a more difficult question. What is the probability that a person is standing on the spot where he or she can make the trip described below.

Hint:

(a) What is the surface area of the earth?

(b) What is the surface area of the that part of the earth between two specified latitude lines.

(c) (You still have to figure out the latitude lines; some of you did this part last week).

(d) It should not be hard to find the formula to get an answer for this. In the next few weeks we will discuss why that formula is true.