Math 4990 Problem Set 7

Due Tuesday, Oct 21, 2014 in class

ERRATUM

p.83, Theorem 3.49, "and C outside the circle, <u>where A, B, and C lie on the same side of the line through P and Q,</u> angle PAQ"

ASSIGNMENT

Liberally peruse **pages 79–86, 103–116** of [DO].

[DO] Exercises 3.24, 3.56, and 4.15.

Problem 4. Prove that every two triangulations of a convex n-gon are connected by at most $2n$ flips. (For no credit, think about whether this is true for non-convex polygons.)

Problem 5. Let S be a finite point set in the plane in general position. We showed that the flip graph of S is connected by using these facts:

(1) A triangulation that is *not* Del(S) admits an increasing flip.
(2) It is impossible to apply an infinite sequence of increasing flips.

Sequentially apply increasing flips to a triangulation. The first fact says that we can only get stuck when we reach Del(S). The second fact says we *will* get stuck.

Prove the second fact.

(See also Exercise 3.47; an increasing flip replaces an illegal edge with a legal one.)