

CISC-868 FALL 2011

HOMEWORK 5

These questions come from *Discrete and Computational Geometry* by Satyan Devadoss and Joseph O' Rourke.

Exercise 3.50: Provide a more formal proof of Thales theorem.

Exercise 3.52: Given the triangles defined in Proposition 3.51, show that D is outside the circumcircle of ABC if and only if B is outside the circumcircle of ACD.

Prove this is true even if ABCD does not form a convex quadrilateral.

Exercise 3.55: Prove that the smallest angle of any triangulation of a convex polygon whose vertices lie on a circle is the same for each triangulation.

Exercise 3.56: For every $n > 3$, design a set of n points in the plane, no four co-circular, such that one vertex of the Delaunay triangulation has degree $n - 1$.

Exercise 3.57: Prove that the triangulation in Figure 3.24(a) is Delaunay.

Exercise 3.63: Show that any polygon must have at least three convex vertices.

Proof by contradiction using Exercise 1.11.

Exercise 3.64: Show that the convex hull of any pseudo-triangle is a triangle.