Quiz 4 Information

MATH 261 Computational Geometry

The final quiz in this course will be Monday, January 27. To prepare for this quiz, you should study the material in Sections 4.1–4.4, 5.1–5.3, 5.7, and 6.1 of the text. Focus on the *definitions*, *examples*, *theorems*, and *algorithms* in the text.

In particular, you should be able to do the following:

1. Be able to state precise definitions of the following terms and give examples of them:

- Voronoi diagram, Voronoi region, Voronoi edges, Voronoi vertices
- Medial axis, straight skeleton
- Minkowski sum
- Curve reconstruction, correct polygon reconstruction
- Convex polyhedron, regular polyhedron, Platonic solids

2. Be able to give precise answers to the following questions:

- How does the *incremental algorithm* construct a Voronoi diagram from a point set?
- What is does it mean that the Delaunay triangulation is the *dual graph* of the Voronoi diagram?
- How are Delaunay triangulations related to 3D convex hulls (in Section 4.4)?
- How does the algorithm in Section 5.1 construct the medial axis?
- How does the medial axis differ from the straight skeleton of a polygon?
- How is the Minkowski sum of two convex polygons computed? How is this more complicated if the polygons are not convex?
- How does the CRUST algorithm work?
- In what sense is the CRUST algorithm "provably correct"?
- Why are the Platonic solids the only regular polyhedra?