

## CS133 - Winter 2003 - Quiz 2 - Feb. 11, 2002

**Name:**

**SSN (4 last digits):**

You have to answer all 4 problems. Each is worth 25%. Good luck!

Only students that are registered for CS133 can take this exam.

1. How many trapezoids are in the trapezoid decomposition of a simple polygon with  $n$  vertices (including  $r$  reflex vertices)? Prove it for extra credit.
2. Prove that the trapezoid decomposition of a monotone polygon can be computed in linear time.
3. What is the best and worst case running time of the Gift wrapping algorithm for computing the convex hull of  $n$  points in the plane? Prove your answers (giving examples).
4. Describe how to use the trapezoid decomposition of a simple polygon with  $n$  vertices (including  $r$  reflex vertices) to partition the polygon into a set of monotone polygons. How many monotone polygons can we get?