

CSc 437
Homework #5
Due 11/22/11

Instructions. All assignments are to be completed on separate paper. Use only one side of the paper. Assignments will be due at the beginning of class, or via email. To receive full credit, you must show all of your work.

Unless otherwise specified, all questions are taken from the textbook (second edition)

All lines discussed in this homework are non-vertical.

1. 8.1
2. 8.2
3. 8.4
4. 8.15
5. Show that computing the intersection of a set of n halfplanes takes $\Omega(n \log n)$ time. (hint — use duality and bounds on convex hull).
6. Let $S = \{s_1 \dots s_n\}$ be a set of segments in the plane, and let P be the set of $2n$ endpoints of these segments. We define the visibility graph $G(V, E)$ as follows. The vertices $V = P$, and $(p, q) \in E$ iff the segment $\bar{p}q$ connecting p and q does not cross any of the segments of S . Note that $\bar{p}q$ might, but is not necessarily a segment of S .
Given S , suggest an $O(n^2)$ time algorithm for computing $G(V, E)$.
7. 10.8
8. 10.12b