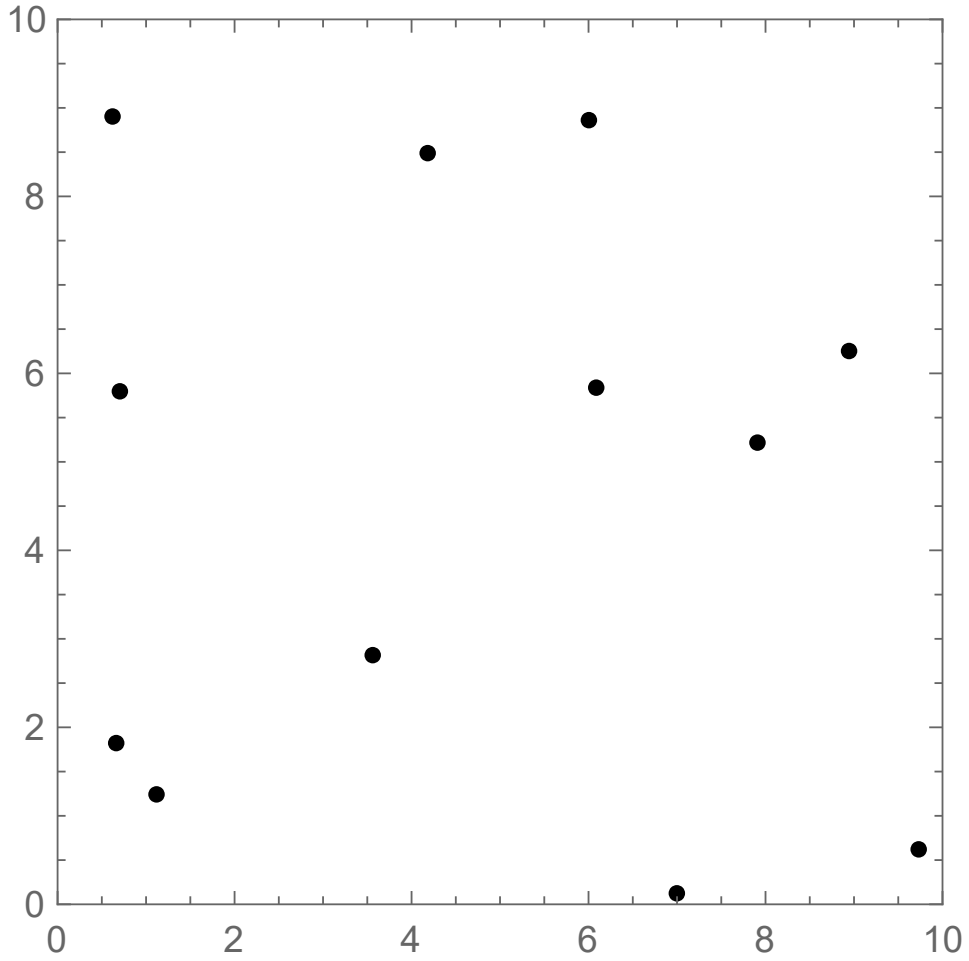
Voroni Diagrams

MATH 261 Computational Geometry

1. Suppose that following map shows the locations of cell towers, and that cell phones always connect to the closest cell tower. Partition the diagram into regions, one per tower, indicating the locations from which phones will connect to that tower.



2. Now suppose you are a consultant helping the cell phone company decide where to place a new cell tower. Where would you position the new tower? Defend your choice.

3. If the cell phone company builds a new tower on the location you recommended, how does your diagram change?

4. For each $n \geq 3$, find a point set S with n sites such that $\mathrm{Vor}(S)$ has the maximum possible number of vertices. What is this maximum number of vertices?

5. For each $n \geq 3$, find a point set S with n sites such that $\mathrm{Vor}(S)$ has the maximum possible number of edges. What is this maximum number of edges?