1. Prove that for any \( n > 3 \), there is a set of \( n \) point sites in the plane such that one of the cells of Vor(\( P \)) has \( n - 1 \) vertices.

2. Show that Theorem 7.3 implies that the average number of vertices of a Voronoi cell is less than six.

3. Let \( P \) be a set of \( n \) points in the plane. Give an \( O(n \log n) \) time algorithm to find two points in \( P \) that are closest together. Show that your algorithm is correct.

4. Prove that the breakpoints of the beach line, as defined in Section 7.2, trace out the Voronoi diagram while the sweep line moves from top to bottom.