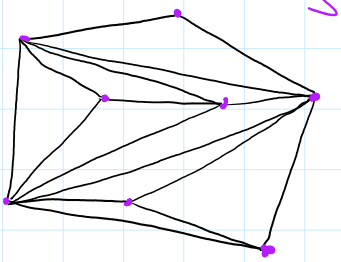
How Many Triangles?

Assume we have n points, not all collinear.

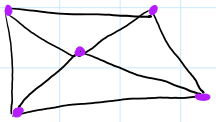
If h points are on the convex hull and k are in the interior ($n = h + k$), then each triangulation has $h-2+2k$ triangles?

Triangulation Algorithms

1. Triangle-Splitting:



→ Does not produce all triangulations:



→ Complexity:

find the hull: $O(n \log n)$

triangulate the hull: $O(n)$

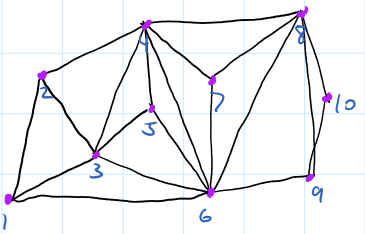
loop over all interior points: $O(n)$

  find containing triangle: $O(n)$

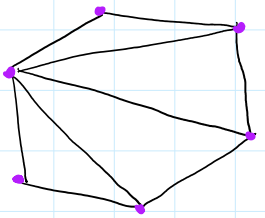
  insert 3 edges: $O(1)$

} $O(n^2)$

2. Incremental Algorithm:



→ Cannot produce all triangulations:



→ Runtime: $O(n^2)$

Sort: $O(n \log n)$

add points incrementally: consider $O(n)$ points

for each, find visible edges of existing triangulation $- O(n)$

} $O(n^2)$