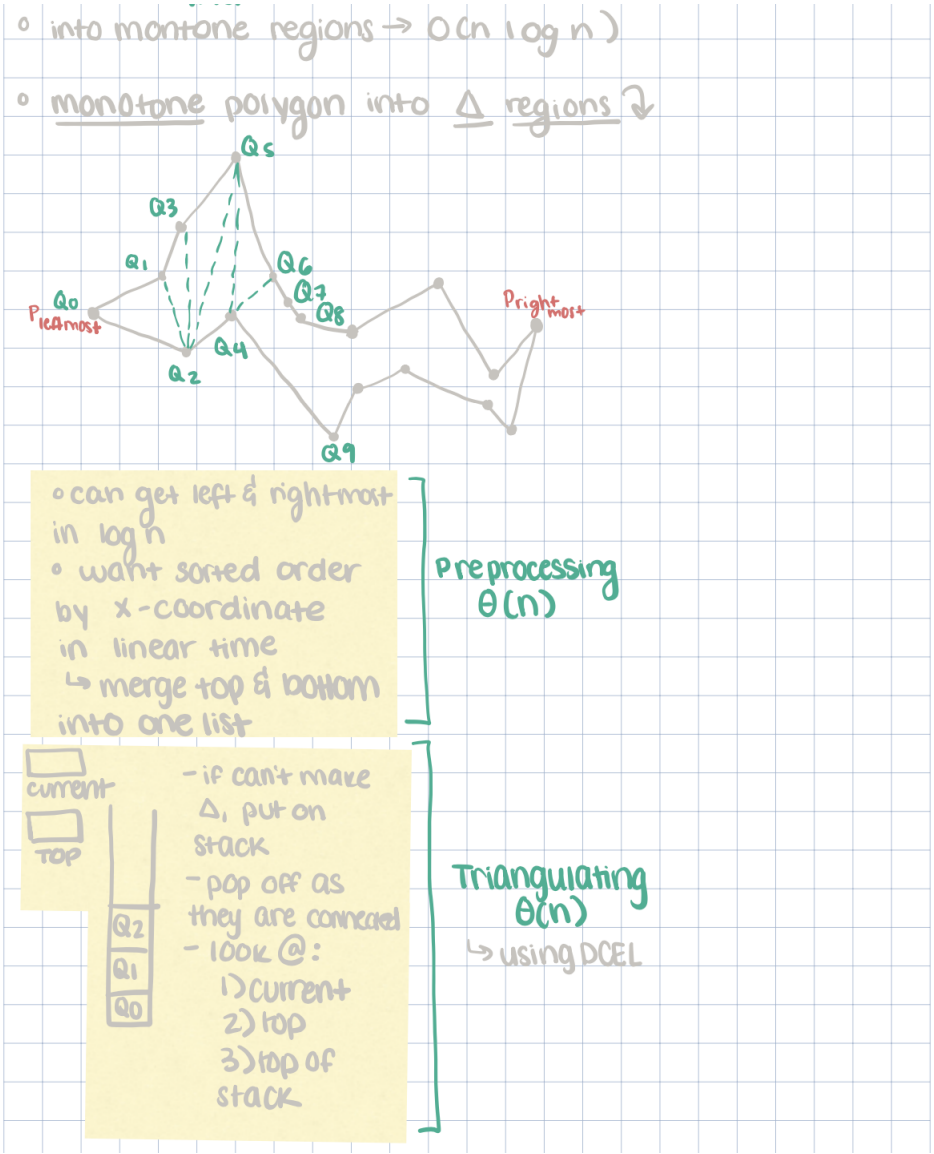
# Regularizing A Planar Subdivision

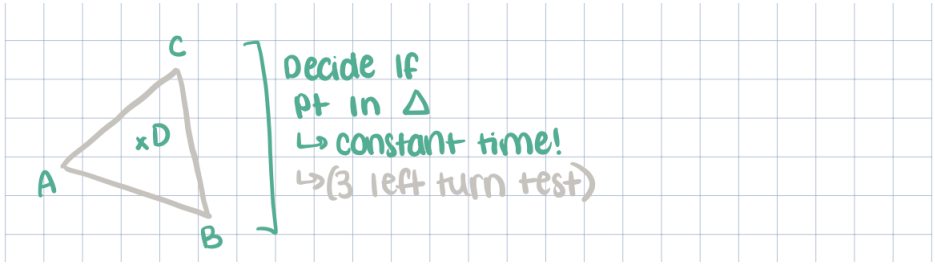
**Regularizing a Planar Subdivision**

Regularizing into monotone regions: $O(nlogn)$

Splitting monotone polygon into triangular regions: $\Theta(n)$



Determining if a point is inside a triangle: $O(1)$

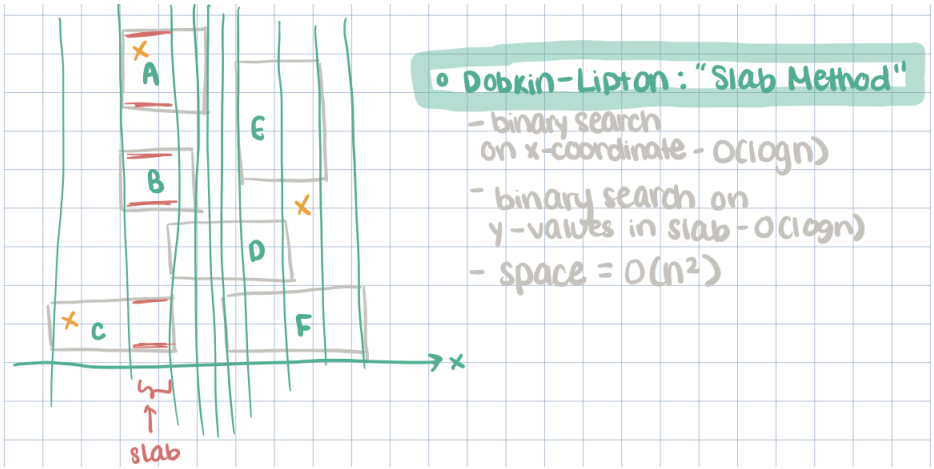



**Dobkin-Lipton: Slab Method**

Binary Search on X-Coordinate: $O(logn)$

Binary Search on Y-Coordinate: $O(logn)$

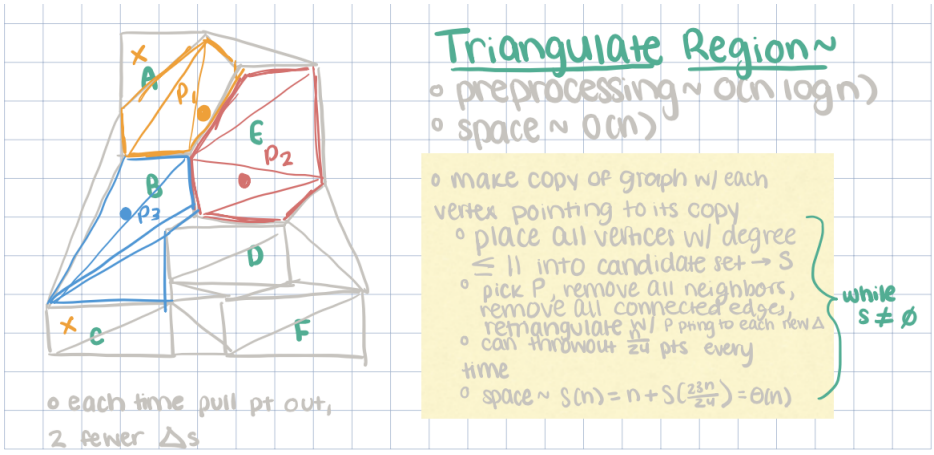
Space: $O(n^2)$



**Triangulating**

Preprocessing: $O(nlogn)$

Space: $O(n)$



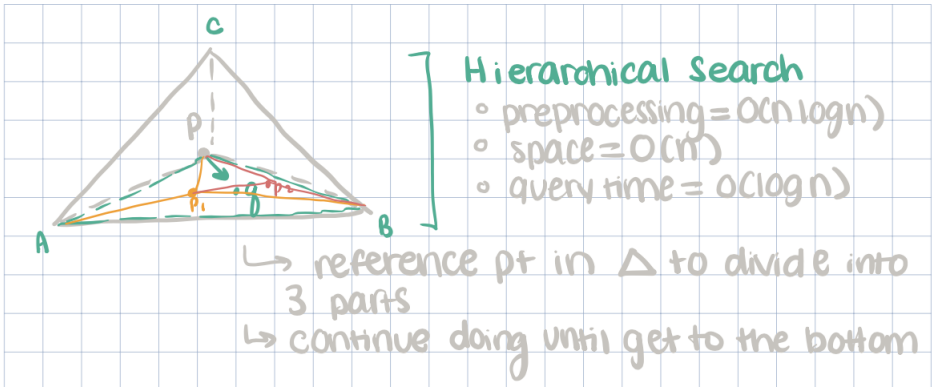

**Hierarchial Search**

Can use this algorithm to locate a point inside a triangle

Preprocessing: $O(nlogn)$

Query Time: $O(logn)$

Space: $O(n)$




KIRKPATRICK: ½ of the vertices have degree ≤ 12

Euler's Theorem