03-E-08

Triangulation

Triangulation

- Properties

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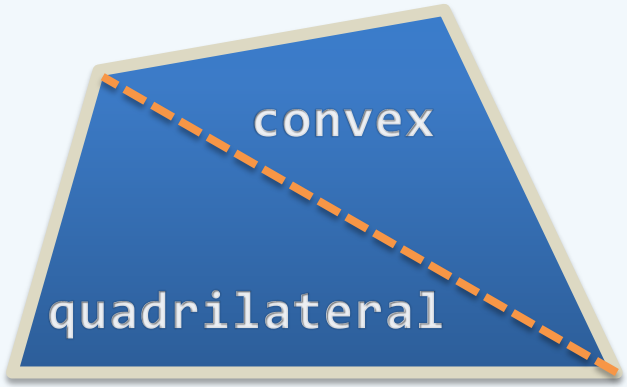
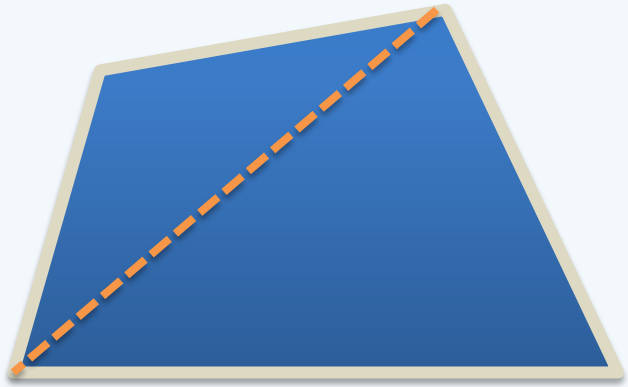
Uniqueness?

❖ A simple polygon may have more than one triangulation





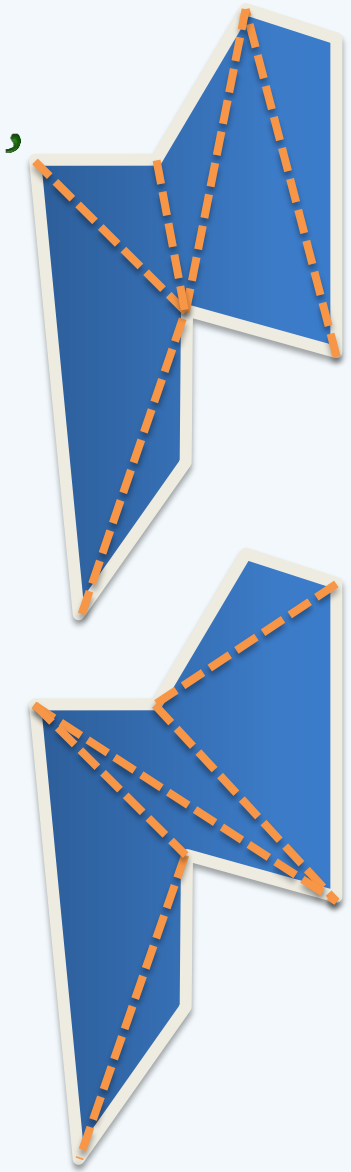
1. How many triangulations can a simple n-gon have?

2. Which polygons achieve the maximum numbers?

3. For each n > 3, give an n-gon with a unique triangulation

Complexity

- Although a simple polygon usually have many triangulations, they would share some things in common
- It can be proved by induction that for a simple n-gon without holes, each triangulation
  1) uses n – 3 internal diagonals and
  2) consists of n – 2 triangles
- For the triangulations of a simple n-gon with h holes
  1) how many internal diagonals are used? And
  2) how many triangles are there?



Dual Graph

- Let T(P) be a triangulation of a simple polygon P
- The dual graph of T(P) is a tree iff P has no holes
- For an n-gon with h holes, how many cycles does the dual graph of T(P) have?