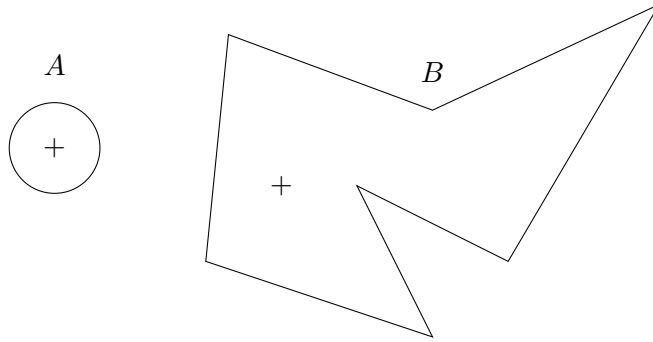# Minkowski Sums

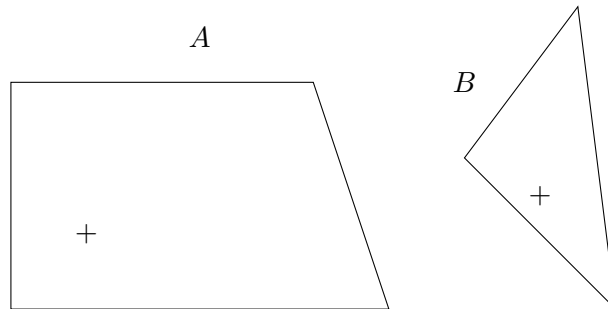## MATH 261 Computational Geometry

For each pair of point sets A and B, construct the Minkowski sum $A \oplus B$.
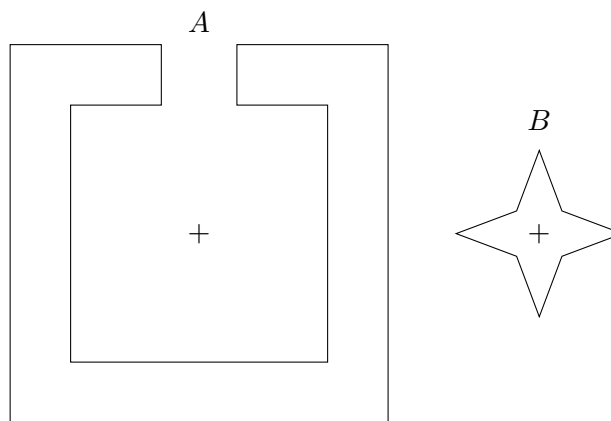
1. A disk and a polygon:

A

B

2. Two convex polygons:

A

B

3. Two nonconvex polygons:

A

B

4. Let A and B be convex polygons with m and n vertices, respectively. How many vertices does $A \oplus B$ have?

5. How are $A \oplus B$ and $A \oplus C$ related to $A \oplus (B \cup C)$?

6. Let A be a convex polygon with m vertices and B a nonconvex polygon with n vertices. What can you say about the number of vertices of $A \oplus B$?

7. Let A and B be nonconvex polygons with m and n vertices, respectively. What can you say about the number of vertices of $A \oplus B$?

8. Describe an algorithm for computing the Minkowski sum of convex polygons A and B. How would you adapt your algorithm for nonconvex polygons?