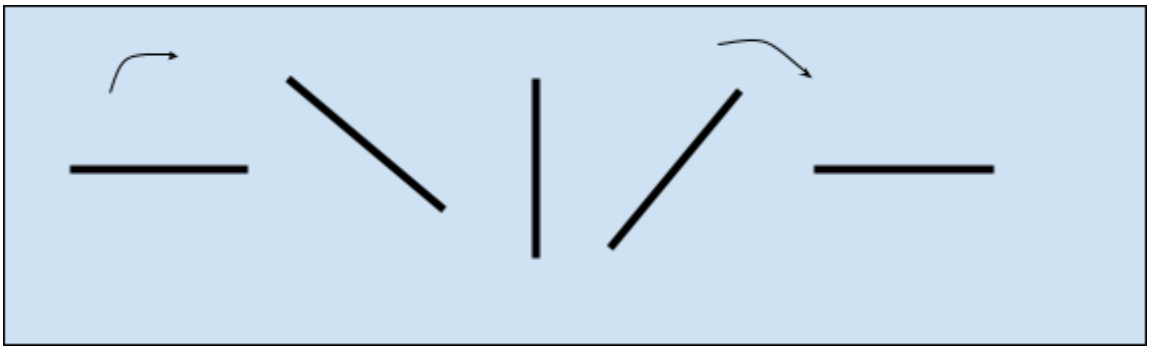
Warmup

Start with a line segment of length 1 in the plane. Draw a region inside which you can turn the line segment 180° (all the way around) while staying completely inside the region.

Example: In the big rectangle below, we have plenty of room to turn the line segment 180°



Your turn: I bet you can draw a *smaller* region that works. Try it below. What is the *smallest* area needed to turn the line segment 180°?

Questions:

1. What is the smallest area you found? Do you think you can do better?

2. Lines have *slopes*. Which slopes does our line segment take on as we continuously rotate it around in the plane?