What does it mean to sweep a shape?
Imagine a shape filled with crumbs. Using orthogonal or slanted sweeps, we push all of the crumbs into a single point. The sweep cost is defined as the distance that the sweeper moves.

Restricting our attention to two-sweeps and triangles, the minimum sweeping cost is always achieved by enclosing the triangle in a minimum perimeter parallelogram.

One-flush Lemma: The minimal perimeter enclosing parallelogram is always flush against at least one edge of the convex hull. [Mitchell and Polishchuk 2006]

Theorem:
Normalize triangle so that the longest edge = 1. Let θ be the \(ab\)-apex.
If \(θ \geq 90\), the min cost sweep is determined by the parallelogram 2-flush against \(a\) and \(b\).
If \(θ \leq 90\), the min cost sweep is determined by the rectangle 1-flush against the shortest side.

However....

Conjecture: Minimal cost sweeping can be achieved with two sweeps for any convex shape.

Proof that, for acute triangles, the cost of sweeping 1-flush against the shortest side \(b\) is less than sweeping 1-flush against the longest (1).

\[ h_b < 1 \\
\frac{h_b}{1-b} < (1-b) \\
h_b - h_b < 1-b \\
bh_b = h_1 \\
h_b - h_1 < 1-b \\
h_b + b < 1 + h_1 \]