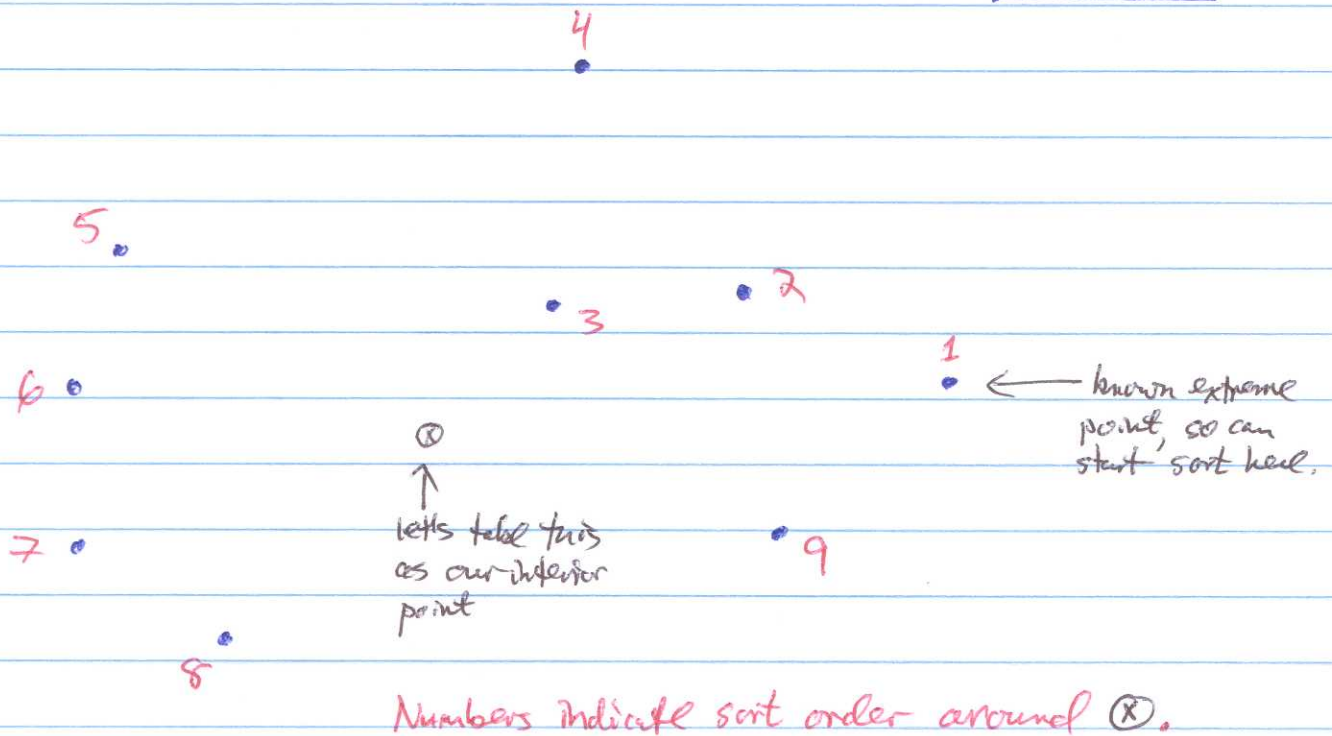


Graham's Scan Example, with finger backing up & discarding previously ok point,



Three finger locations

3, 2, 1
4, 3, 2
4, 2, 1
5, 4, 1
6, 5, 4
7, 6, 5
8, 7, 6
9, 8, 7
1, 9, 8

Technically, we backup to 4, 1, 9 here and then advance to 5, 4, 1. But since 1 is a known extreme point, we can short-circuit that process.

notice how we have backed up to 1 and are again testing convexity at 2.

Decision

keep 2 (further) & advance the fingers
discard 3 & backup "middle" & "right" fingers
discard 2 & backup
keep 4 & advance
keep 5 & "
keep 6 & "
keep 7 & "
keep 8 & "
keep 9 & "

we could now test 4, 1, 9 and see that we really can keep 1, but we already knew that, since we chose 1 as an extreme point. So we see that the convex hull is formed by the points 1, 4, 5, 6, 7, 8, 9, 1 (in that order).

$O(n)$ complexity since: Each step either advances all three fingers or backs up the middle & right fingers and discards a point. When doing that, left finger never backs up. So at most $2n$ steps.