Convex Hull: Graham's Scan, Algorithm Explained

Pseudocode:

P = number of Points

Coordinates[P+1] will be the array of Coordinates

find lowest y-coordinate and swap with P[1]

use a for loop:

for i = 0 to P ← During this loop we will use } keeps track of Coordinates.
- p → previous point
- c → current point
- n → next point

This loop will use previous Point [(P[i-1]), current point (P[i]), next point (P[i+1])]

use X to determine # of Points on Convex Hull.
if X is greater than 1, then X -= 1 to truncate.

swap P[X] with P[i]

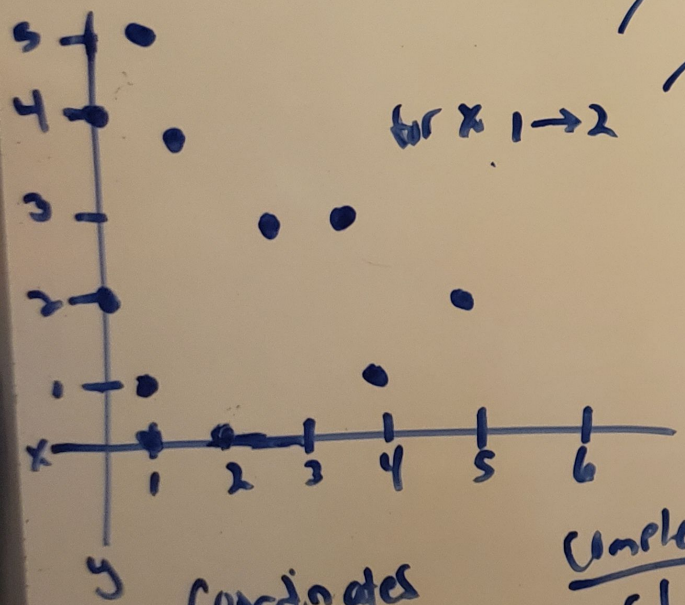
P = Previous coordinate

C = Current coordinate

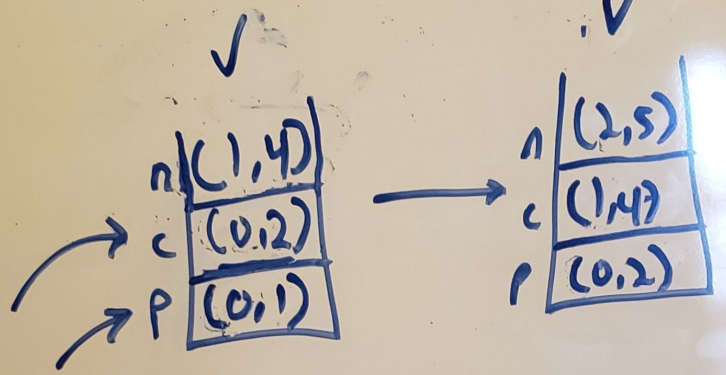
n = next coordinate

By using stacks we can check which coordinates Pass/fail.

Example:

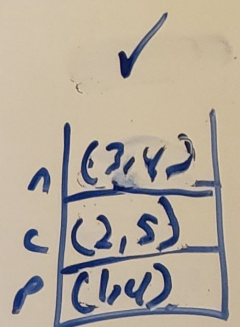


for x 1→2



✓

✓



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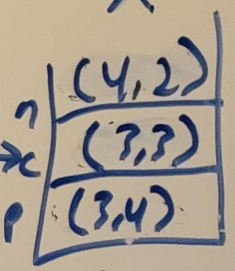
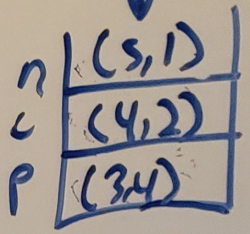


X

- ★ checks for current adjacent neighbors
- ★ The graham's scan also scans right to left according to closest X-coordinate
  - Does calculations in finding the furthest X coordinate

furthest y-coordinate is n.



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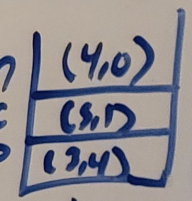
n becomes C



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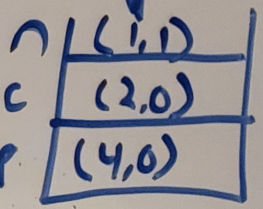
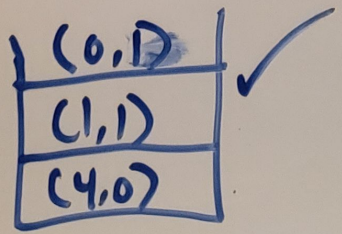
Place P as n.



X



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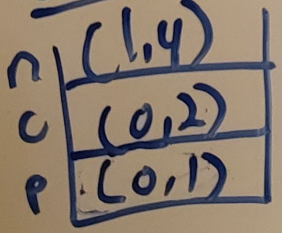
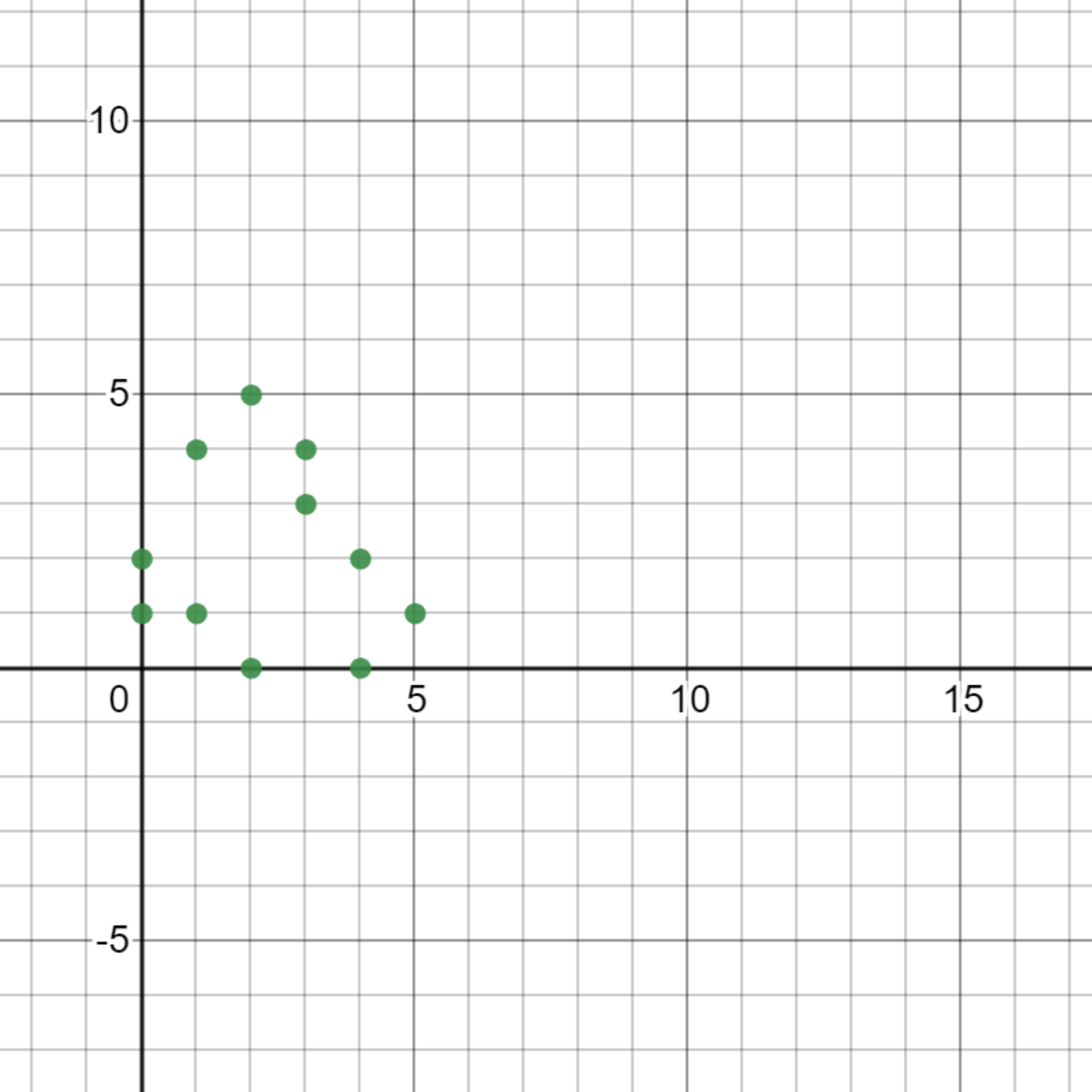
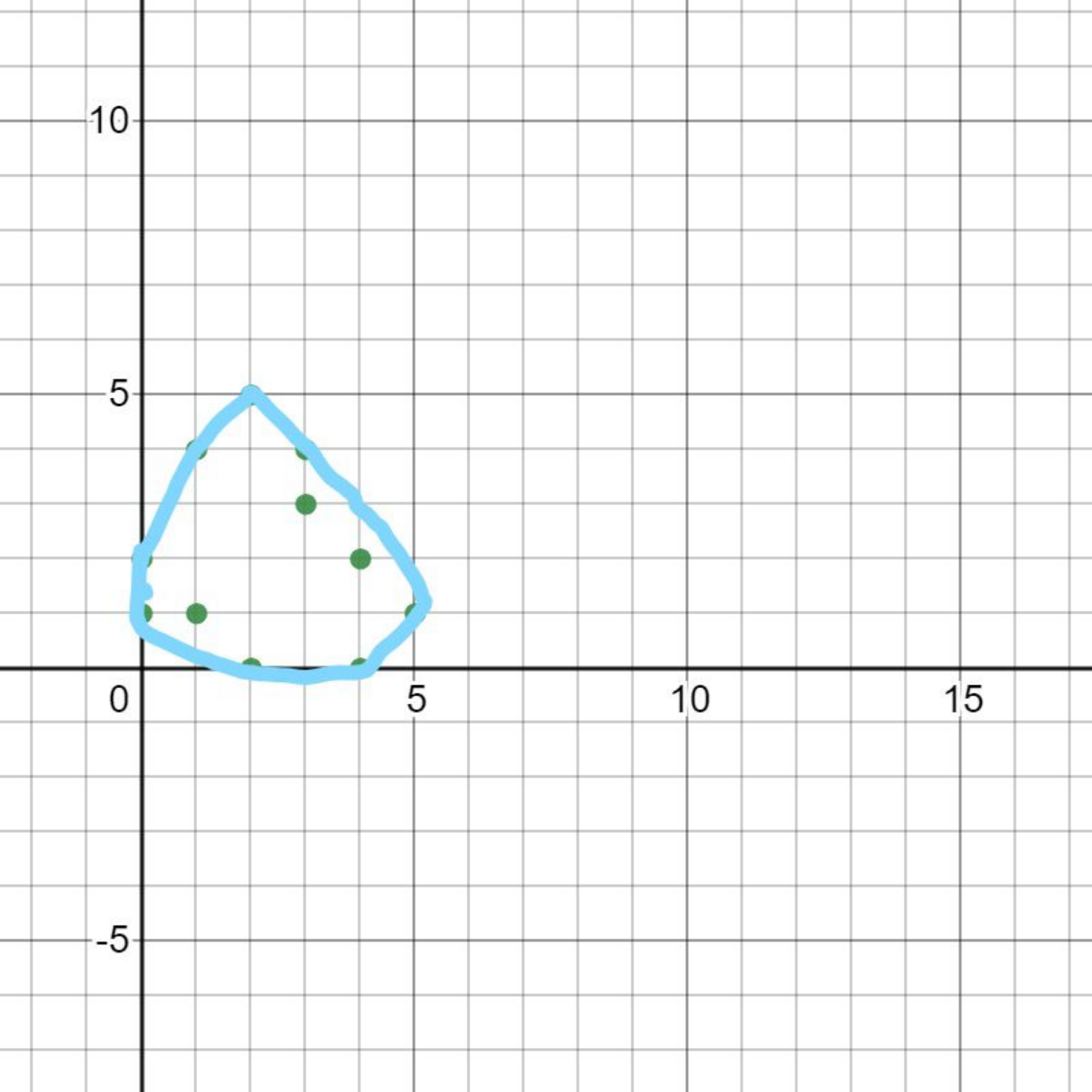
Complete



Coordinates

(0,1)	(2,0)
(0,2)	(3,4)
(1,4)	(5,1)
(2,5)	(1,1)
(4,0)	(4,2)
(3,3)	


10
5
0
5
10
15
-5


10
5
0
5
10
15
-5