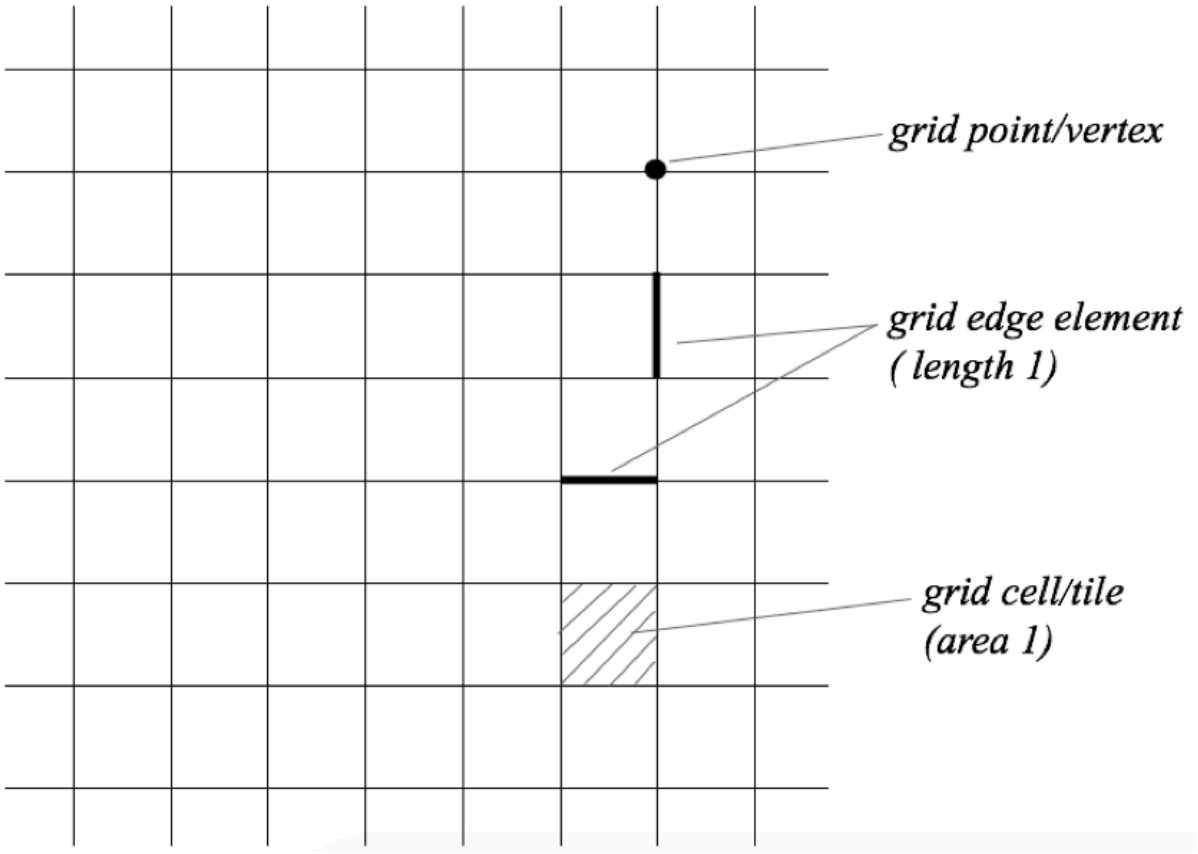
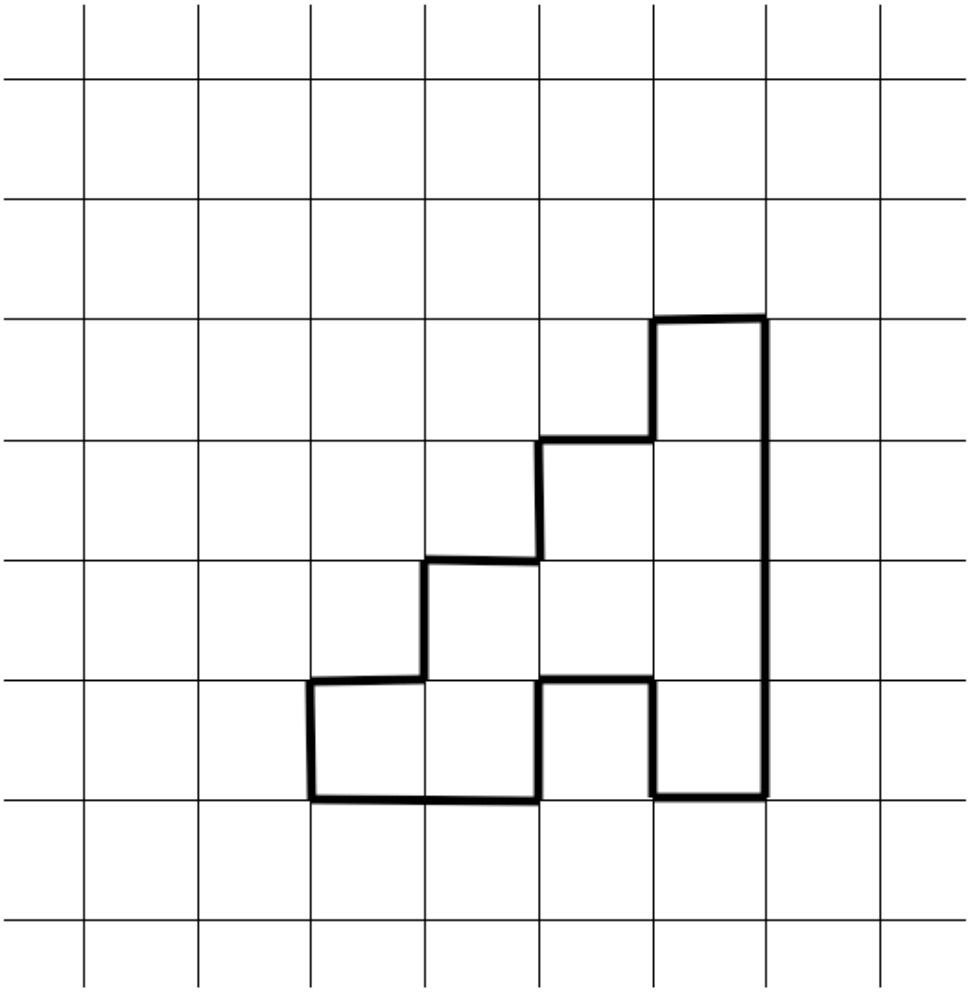
Unit n° 24

CoPick

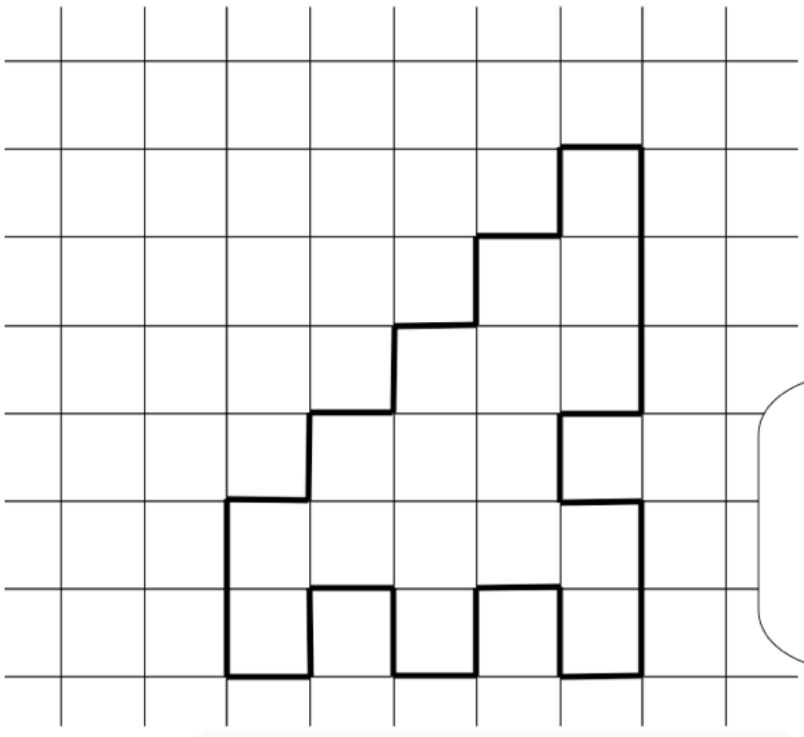
A simple closed polyomino [1,2,3] is located in a square grid graph [4,5,6]



f.e.



A = 9
B = 18
I = 1
b = 18
i = 9



A = 17
B = 28
I = 4
b = 28
i = 20

Check equ. (1)
2A = 2I + B - 2
34 = 8 + 28 - 2 = 34 ... ok

Check equ. (2)
4A = 2i + b
68 = 40 + 28 = 68 ... ok

Let denote

A – area of the polyomino in grid cell area units

B – number of grid points on the polyomino's perimeter (boundary points)

I – number of grid points inside the polyomino (interior points)

b – number of grid edge elements on the polyomino's perimeter (boundary **gee**)

i – number of **gee** inside the polyomino (interior **gee**)

$$2A = 2I + B - 2$$

(special case of Pick's theorem[7,8,9,10]) (1)

$$4A = 2i + b$$ (CoPick) (2)

Problems

** Check equ.(2) with the polyominos in Unit 23 and in [2,3].

** Try to extend equ.(2) on the Pick's theorem's validity level, starting with the example in Unit 23, p.8.

** Check other relations between A, B, I, b and i, except equ.(1) and (2).

f.e. $B = b$? (3)

$A = i - I + 1$? (4)

References:

[1] Weisstein, Eric W. "Polyomino." From MathWorld--A Wolfram Web Resource. http://mathworld.wolfram.com/Polyomino.html

[2] https://en.wikipedia.org/wiki/Polyomino

[3] https://de.wikipedia.org/wiki/Polyomino

[4] http://mathworld.wolfram.com/Grid.html

[5] https://en.wikipedia.org/wiki/Lattice_graph

[6] https://de.wikipedia.org/wiki/Gittergraph

[7] Weisstein, Eric W. "Pick's Theorem." From MathWorld--A Wolfram Web Resource. http://mathworld.wolfram.com/PicksTheorem.html

[8] https://en.wikipedia.org/wiki/Pick%27s_theorem

[9] https://de.wikipedia.org/wiki/Satz_von_Pick

[10] http://www.mcs.drexel.edu/~crorres/Archimedes/Stomachion/Pick.html

Lateral:

[11] Weisstein, Eric W. "Gear Curve." From *MathWorld*--A Wolfram Web Resource. http://mathworld.wolfram.com/GearCurve.html
[12] Weisstein, Eric W. "Buffon's Needle Problem." From MathWorld--A Wolfram Web Resource. http://mathworld.wolfram.com/BuffonsNeedleProblem.html
[14] https://en.wikipedia.org/wiki/Buffon%27s_needle
[15] https://de.wikipedia.org/wiki/Buffonsches_Nadelproblem

21.02.2017 EPS