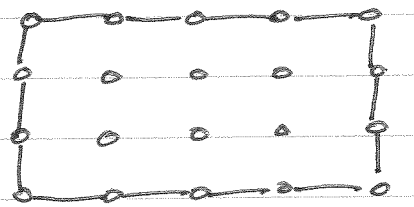
Pick's Theorem

Given a polygon P determined by a sequence of integer grid points we define

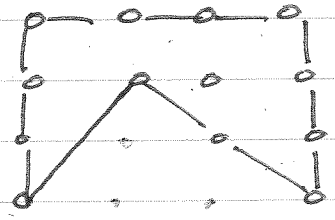
$i(P)$ = number of integer grid points strictly inside P

$o(P)$ = number of integer grid points on boundary of P

examples



$i(P) = 6$
$o(P) = 14$
area $= 12$



$i(P) = 1$
$o(P) = 12$
area $= 6$

(1899)

Pick's Theorem. For a polygon P determined by a sequence of integer grid points,

$$\text{area}(P) = i(P) + \frac{1}{2} o(P) - 1$$