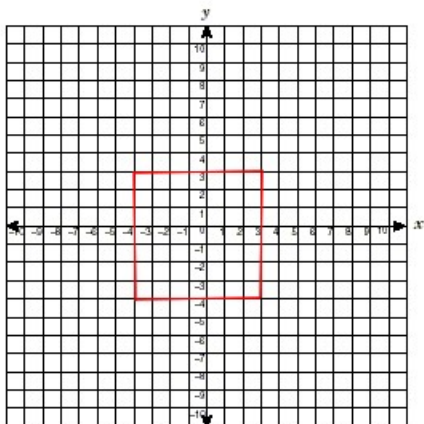
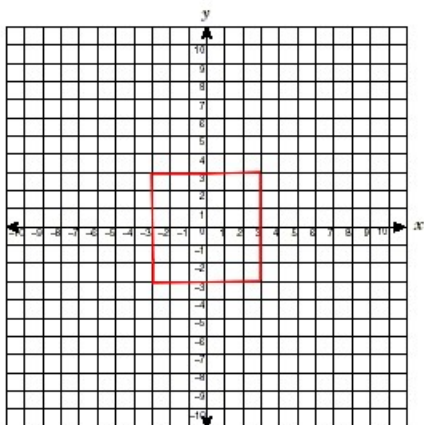


Steps on The Coordinate Plane

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Rules



1. A n -step, where n is a positive integer, is a line segment of length n and slope 0 or *undefined*, or a line segment of length $n\sqrt{2}$ and slope of 1 or -1 . The endpoints of a n -step must be on a lattice point. For example, you may construct a 2 -step segment with length of $2\sqrt{2}$ and endpoints on $(2, 2)$ and $(4, 4)$.
2. Your n th construction must be an n -step. For example, your 1 st construction must be a 1 -step. Your 2 nd construction must be a 2 -step. Your 14 th construction must be a 14 -step.
3. For every $n \geq 2$, a n -step must share an endpoint with a $(n-1)$ -step.
4. Two n -steps may only intersect at their endpoints.
5. Every lattice point may contain at most two n -steps.

Tasks

1. On the graph, construct a figure that passes through all lattice points (a, b) where $-3 \leq a \leq 3$ and $-3 \leq b \leq 3$.
 2. On the graph, construct a figure that passes through all lattice points (a, b) where $-4 \leq a \leq 3$ and $-4 \leq b \leq 3$.
 3. Construct a figure that passes through all lattice points (a, b) where $0 \leq a \leq x$ and $0 \leq b \leq y$.
- (a) What is the minimum number of lattice points (including the endpoints of line segments) a figure passes through, in terms of the given coordinates?
- (b) How many ways are there to construct such a figure?