

1. Each straight line intersects the boundary curve at most two times.
2. If a rectangle has at least one of its vertical sides intersecting the boundary curve, count it as a type X rectangle and record it with a corresponding rectangle on a row next to the x-axis.
3. If a rectangle has at least one of its horizontal sides intersecting the boundary curve, count it as a type Y rectangle and record it with a corresponding rectangle on a column next to the y-axis.
4. The total number of X and Y type rectangles are bounded by $2M$ and $2N$ respectively.
5. The total area of the 'error rectangles' is bounded by $2(M+N)(b-a)(d-c)/(MN)$.

