Coppersmith, Don; Nagy, Győző; Ravsky, Sasha
On curves contained in convex subsets of the plane. (English) Zbl 1084.52504

Summary: If $K' \subset K$ are convex bodies of the plane then the perimeter of $K'$ is not greater than the perimeter of $K$. We obtain the following generalization of this fact. Let $K$ be a convex compact body of the plane with perimeter $p$ and diameter $d$ and let $r > 1$ be an integer. Let $s$ be the smallest number such that for any curve of length greater than $s$ contained in $K$ there is a straight line intersecting the curve at least in $r + 1$ different points. Then $s = rp/2$ if $r$ is even and $s = (r - 1)p/2 + d$ if $r$ is odd.

MSC:
52A10 Convex sets in 2 dimensions (including convex curves)
52A38 Length, area, volume and convex sets (aspects of convex geometry)

Keywords:
convex body; strictly convex body

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