AN AREA INEQUALITY FOR ELLIPSES INSCRIBED IN QUADRILATERALS

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Abstract. If $E$ is any ellipse inscribed in a convex quadrilateral, $D$, then we prove that $\frac{\text{Area}(E)}{\text{Area}(D)} \leq \frac{\pi}{4}$, and equality holds if and only if $D$ is a parallelogram and $E$ is tangent to the sides of $D$ at the midpoints. We also prove that the foci of the unique ellipse of maximal area inscribed in a parallelogram, $D$, lie on the orthogonal least squares line for the vertices of $D$. This does not hold in general for convex quadrilaterals.


Keywords and phrases: Area inequality; ellipse; quadrilaterals.

REFERENCES