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AN AREA INEQUALITY FOR ELLIPSES INSCRIBED IN QUADRILATERALS

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

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