Polar Convexity and a Refinement of the Gauss-Lucas Theorem

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We will introduce the notion of polar convexity, which extends the usual notion of convexity. We will give examples, explain its basic properties, and show how it arises in various situations. Then, we will use it to give a new refinement of the classical Gauss-Lucas theorem for complex polynomials. The Gauss-Lucas theorem states that the critical points of a polynomial are in the convex hull of its zeros.

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