Summary: In this paper, we use Rouché’s theorem and the pleasant properties of the arithmetic of the logarithmic derivative to establish several new results and bounds regarding the geometry of the zeros, poles, and critical points of a rational function. Included is an improvement on a result by Alexander and Walsh regarding the “exclusion region” around a given zero or pole of a rational function in which no critical point may lie.

MSC:

30C15 Zeros of polynomials, rational functions, and other analytic functions of one complex variable (e.g., zeros of functions with bounded Dirichlet integral)

Keywords:

rational functions; zeros and poles; critical points; Rouché’s theorem

Full Text: DOI

References:


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