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# Constraints on hypothetical counterexamples to the Casas-Alvero conjecture

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The Casas-Alvero conjecture states: if a complex univariate polynomial has a common root with each of its derivatives, then it has a unique root. We show that hypothetical counterexamples must have at least 5 different roots. The first case where the conjecture is not known is in degree 12. We study the case of degree 12, and more generally degree  $p+1$ , where  $p$  is a prime number. While we don't come closing to solving the conjecture in degree 12, we present several further constraints that counterexamples would have to satisfy.

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