

Primes as Sums and Differences of Two Binomial Coefficients and Two Powersums

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Abstract : Many problems exist in additive number theory which is essential to determine the primes that are the sum of two elements from a given single-variable polynomial sequence, and most of them are unattackable in the present day. Here, we determine solutions for this problem to a few certain sequences (certain binomial coefficients and power sums) using only elementary algebra and some algebraic factoring methods (as well as Euclid's Lemma and Faulhaber's Formula). In particular, we show that there are finitely many primes as sums of two of these types of elements. Several cases are fully illustrated, and bounds are presented for the cases not fully illustrated.

Keywords : binomial coefficients, power sums, primes, algebra

Conference Title : ICM 2022 : International Conference on Mathematics

Conference Location : Dubai, United Arab Emirates

Conference Dates : December 20-21, 2022