

## Asymptotic Behavior of Cosine Power Sums

*Problem 11-002, by MIRCEA MERCA*<sup>1</sup> (Department of Informatics, Constantin Istrati Technical College, Campina, Romania).

Let  $n$  and  $p$  be two positive integers that satisfy  $p < 2n$ . Then

$$\sum_{k=1}^{\lfloor \frac{n-1}{2} \rfloor} \cos^p \left( \frac{k\pi}{n} \right) \sim \frac{n}{\sqrt{2p\pi}} \left( 1 - \frac{17}{72p} \right) - \frac{1}{2} \quad (p \rightarrow \infty).$$

*Status.* This problem is open.

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