

CYCLOTOMIC POLYNOMIALS AT ROOTS OF UNITY

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ABSTRACT: We obtain a formula on $\Phi_n(\xi_m)$ for $(m, n) = 1$, where Φ_n is the n th cyclotomic polynomial and ξ_m is any primitive m th root of unity. The formula is quite effective for small m . In our method we use finite Fourier analysis and properties of Dirichlet characters.

As an application we reprove the result of R.C.Vaughan that for infinitely many integers n we have $\log \log A_n = (\log 2 + o(1)) \frac{\log n}{\log \log n}$, where A_n denotes the height of Φ_n .

This is joint work with Pieter Moree and Andrés Herrera-Poyatos.