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Matthew Fickus* (Matthew.Fickus@afit.edu), 2950 Hobson Way, Building 641, Room 302,
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For many years, it has been known that Gauss sums may be used to compute the spectrum of the discrete Fourier transform. We investigate the converse relationship, that is, how basic properties of the discrete Fourier transform may be used to compute Gauss sums. In particular, we develop several algebraic relationships between the discrete Fourier transform and chirp functions which are well-defined over finite cyclic groups. As a consequence, we obtain an elementary proof of the classical Schaar identity, and compute the spectrum of a chirp-Fourier transform. (Received September 12, 2005)