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Infinite products involving Dirichlet characters and cyclotomic polynomials

Using some basic properties of the gamma function, we evaluate a simple class of infinite products involving Dirichlet characters as a finite product of gamma functions and, in the case of odd characters, as a finite product of sines. As a consequence we obtain evaluations of certain multiple L-series. We also derive expressions for infinite products of cyclotomic polynomials, again as finite products of gamma or of sine functions. (Joint work with Christophe Vignat.)