Mahler’s Measure and the Dilogarithm (I)

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Abstract. An explicit formula is derived for the logarithmic Mahler measure \( m(P) \) of \( P(x, y) = p(x)y - q(x) \), where \( p(x) \) and \( q(x) \) are cyclotomic. This is used to find many examples of such polynomials for which \( m(P) \) is rationally related to the Dedekind zeta value \( \zeta_F(2) \) for certain quadratic and quartic fields.