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Frobenius polynomials for Calabi-Yau equations. (English summary)

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Summary: “We describe a variation of Dwork’s unit-root method to determine the degree 4 Frobenius polynomial for members of a 1-modulus Calabi-Yau family over $\mathbb{P}^1$ in terms of the holomorphic period near a point of maximal unipotent monodromy. The method is illustrated on a couple of examples from a list in [G. Almkvist et al., “Tables of Calabi-Yau equations”, preprint, arxiv.org/abs/math/0507430]. For singular points, we find that the Frobenius polynomial splits into a product of two linear factors and a quadratic part $1 - a_p T + p^3 T^2$. We identify weight 4 modular forms which reproduce the a_p as Fourier coefficients.”

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