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Nickolas Andersen* (nandrsn4@illinois.edu), 1409 W Green St, Urbana, IL 61801. *Singular invariants, mock modular forms of weight 5/2, and partitions.*

We study the coefficients of an infinite basis for the space of mock modular forms of weight $5/2$ on the full modular group (these mock modular forms are the subject of Scott Ahlgren's talk). The "shadow" of the first element of this basis is the generating series for partitions. We show that the coefficients of these mock modular forms are given by traces of singular invariants. These are values of non-holomorphic modular functions at CM points or their real quadratic analogues: cycle integrals of such functions along geodesics on the modular curve. The real quadratic case relates to recent work of Duke, Imamoglu, and Toth on cycle integrals of the j -function, while the imaginary quadratic case recovers the algebraic formula of Bruinier and Ono for the partition function. (Received July 28, 2014)