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The Ehrhart quasipolynomial of a rational polytope  $P$  encodes the number of integer lattice points in dilates of  $P$ , and the  $h^*$ -polynomial of  $P$  is the numerator of the accompanying generating function. We provide two decomposition formulas for the  $h^*$ -polynomial of a rational polytope. The first decomposition generalizes a theorem of Betke and McMullen for lattice polytopes. We use our rational Betke–McMullen formula to provide a novel proof of Stanley’s Monotonicity Theorem for the  $h^*$ -polynomial of a rational polytope. The second decomposition generalizes a result of Stapledon, which we use to provide rational extensions of the Stanley and Hibi inequalities satisfied by the coefficients of the  $h^*$ -polynomial for lattice polytopes. Lastly, we apply our results to rational polytopes containing the origin whose duals are lattice polytopes. (Received July 12, 2020)