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Michael Dorff and **Beth Schaubroeck***, beth.schaubroeck@usafa.edu. *Properties of complex-valued harmonic polynomials*. Preliminary report.

What holds true and what changes with respect to standard results of analytic functions when they are generalized to (complex-valued) harmonic functions? In answering this question we begin by presenting some basic properties of harmonic functions, with particular attention to harmonic polynomials (whose terms contain powers of z and \bar{z}). We then explore some conjectures about harmonic polynomials, and suggest some open problems that students and faculty could investigate. For example, for some values of n, c , and k , the polynomial $p(z) = z^n + c\bar{z}^k - 1$ may have up to $n + 2k$ zeros instead of just n zeros. (Received September 20, 2018)