Kendall Williams* (kendallist@yahoo.com). Elements of Polynomials evaluated at points of \( \beta S \). Preliminary report.

Given a set \( S \) with the discrete topology where both \((S, \cdot)\) and \((S, +)\) are semigroups, one may extend the operations on \( S \) to \( \beta S \), the Stone-\v{C}ech Compactification of \( S \). \( \beta S \) is comprised of the ultrafilters on \( S \). With respect to each of its operations individually, \( \beta S \) is a compact right topological semigroup containing \( S \) in its topological center.

Let \( k \in \mathbb{N} \) and \( g(z_1, z_2, \ldots, z_k) \) be an arbitrary polynomial with coefficients in \( S \). We shall evaluate \( g \) on certain elements of \( \beta S \), say \( p_1, p_2, \ldots, p_k \); making \( g(p_1, p_2, \ldots, p_k) \) itself an ultrafilter on \( S \). We characterize subsets of \( S \) that must be elements of the ultrafilter \( g(p_1, p_2, \ldots, p_k) \). (Received September 20, 2010)