1143-12-555 **Paul Baginski*** (pbaginski@fairfield.edu), Department of Mathematics, Fairfield University, 1073 North Benson Rd., Fairfield, CT 06824. *Nonunique factorization in the ring of integer-valued polynomials.*

The ring of integer-valued polynomials $\mathrm{Int}(\mathbb{Z})$ is the set of polynomials with rational coefficients which produce integer values for integer inputs. Specifically,

$$\mathrm{Int}(\mathbb{Z}) = \{f(x) \in \mathbb{Q}[x] \mid \forall n \in \mathbb{Z}\, f(n) \in \mathbb{Z}\}.$$

$\mathrm{Int}(\mathbb{Z})$ constitutes an interesting example in algebra from many perspectives; for example, it is a natural example of a non-Noetherian ring. It is also a ring with nonunique factorization. Every element has only finitely many factorizations, yet the number of irreducibles involved grows without bound. Frisch recently demonstrated that in $\mathrm{Int}(\mathbb{Z})$, you can find an element $f(x)$ that has any factorization lengths you desire and you can even prescribe the number of factorizations of each length. The polynomials constructed in this way have high degree. We give a graded analysis, determining all the possible elasticities and catenary degrees for a polynomial as a function of the degree of the polynomial.

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