

1145-13-2861

Ranthy A.C. Edmonds*, edmonds.110@osu.edu. *Factorization in Polynomial Rings with Zero Divisors*. Preliminary report.

It is well known that if R is a unique factorization domain, then $R[X]$ is a unique factorization domain and vice versa. However, if R satisfies the unique factorization property but is not an integral domain, $R[X]$ does not have to be a unique factorization ring. This example highlights the general bad behavior of factorization properties with respect to the polynomial ring extension $R[X]$ when R is an arbitrary commutative ring with zero divisors.

In this talk we discuss how factorization in an arbitrary commutative ring R with zero divisors differs from when R is an integral domain, and frame that conversation in the context of polynomial rings. Along the way we focus on some of the challenges in factorization that arise when working with zero divisors, and give a characterization of when a polynomial ring over an arbitrary commutative ring has unique factorization. (Received September 25, 2018)