Week 8 Friday

Make sure you know your neighbors' names, and then discuss:

Last time, en route to proving the existence of the Hilbert polynomial, we stated that the set of monomials not contained in a monomial ideal I can be written as a disjoint union of translates of coordinate subspaces of $\mathbb{N}^n$.

How do you do this for $I = \langle xyz^2, x^2z, x^3y^2 \rangle$?

Catch Up

1. Compute the Hilbert polynomial, dimension, and degree of the ideal $I = \langle y - x^2, z - x^3 \rangle \subseteq k[x, y, z]$ of the twisted cubic. *Hint.* grevlex?

2. (A) True or (B) False? Suppose I is a radical ideal in $k[x_1, \ldots, x_n]$ with $V(I) = \emptyset$. Then $\mathrm{HP}_I(s) = 0$.

3. (A) True or (B) False? Suppose S is a subset of $\mathbb{A}^n(k)$ consisting of just one point. Then $\mathrm{HF}_I(s) = 1$ for all integers $s \geqslant 0$.