

## MA 765 Homework 1

Due Friday, January 26

Let  $I \subset k[x, y, z, w]$  be the ideal  $I = \langle y^2 = xz, z^2 = yw, xw = yz \rangle$ .

1. Show that  $k[x, y, z, w]/I$  is isomorphic to  $k[x^3, x^2y, xy^2, y^3] \subset k[x, y]$ .
2. Prove that  $Z(I)$  is irreducible.
3. What is the dimension of  $Z(I)$ ?