Homework 2
Due: September 15, 2016

1. (Not to hand in) Exercise 10.13.

2. Assume that the characteristic of k is not 2. Prove that the set of unipotent elements in SL_2 is isomorphic to the cone in $\mathbb{A}^3$ given by $x^2 + y^2 = z^2$. (*Hint*: it might be easier to first show that it is isomorphic to the variety given by $x^2 + yz = 0$ and then do a change of coordinates.)

3. Exercise 10.12.

4. Exercise 10.15(a)–(b) (you may use 10.14 without proof).

5. Exercise 10.16.