PROBLEM SET 7 (DUE ON THURSDAY, OCT 29)

(All Exercises are references to the November 18, 2017 version of *Foundations of Algebraic Geometry* by R. Vakil.)

Problem 1. Exercise 7.3.F (an application of the affine-locality of affine morphisms)

Problem 2. Exercise 7.3.K (finite morphisms have finite fibers - you can assume Exercise 7.3.H, but that exercise is worth thinking about as well)

Problem 3. Exercise 8.1.J(d) (an example of scheme-theoretic intersection not distributing over scheme-theoretic union)

Problem 4. A *quadric* in $\mathbb{A}^n_k$ is a closed subscheme $V(f)$ cut out by a single polynomial of degree two. Give an example of two quadrics in $\mathbb{A}^2_{\mathbb{C}}$ intersecting in a single point, and compute the scheme-theoretic intersection. Then give a second example of this, with scheme-theoretic intersection not isomorphic (as schemes) to that in your first example.