

PROBLEM SET 7 (DUE ON THURSDAY, OCT 26)

(All Exercises are references to the July 31, 2023 version of *Foundations of Algebraic Geometry* by R. Vakil.)

- Problem 1.** Exercise 5.3.C (integrality conditions for Noetherian schemes)
- Problem 2.** Exercise 8.3.J (finite morphisms have finite fibers - you can assume Exercise 8.3.G in the proof, though you may want to think about the algebra in that exercise as well)
- Problem 3.** Let $\pi : \mathbb{A}_k^2 \rightarrow \mathbb{A}_k^2$ be a dominant morphism of k -schemes. Is π necessarily finite?
- Problem 4.** Let $\iota : X \rightarrow \mathbb{P}_{\mathbb{C}}^1$ be a closed embedding that is not an isomorphism. Is X necessarily affine?