PROBLEM SET 6 (DUE ON THURSDAY, OCT 19)

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

Problem 1. Exercise 8.3.E (an application of the affine-locality of affine morphisms)

Problem 2. We say that two integral schemes X, Y are *birational* (to each other) if there are nonempty opens $U \subseteq X, V \subseteq Y$ such that U and V are isomorphic. This implies that their function fields $K(X), K(Y)$ are isomorphic.

(a) Give an example of two integral schemes X, Y which are not birational but have isomorphic function fields.

(b) Give an example of two integral schemes X, Y which are birational, such that neither one is isomorphic to an open subscheme of the other.