PROBLEM SET 4 (DUE ON THURSDAY, OCT 25)

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

Problem 1. Exercise 5.1.E (quasicompact schemes have closed points)

Problem 2. Exercise 5.1.I (projective A-schemes are q.c.q.s.)

Problem 3. Exercise 5.2.H (defining the function field of an integral scheme)

Problem 4. Exercise 5.2.I (restriction maps on integral schemes are inclusions)

Problem 5. Let $S_\bullet$ be a graded ring that is also an integral domain. Prove that $\operatorname{Proj} S_\bullet$ is an integral scheme. Describe the function field $K(\operatorname{Proj} S_\bullet)$ in terms of $S_\bullet$ in a choice-free way.

Problem 6. Exercise 5.3.C (integrality conditions for Noetherian schemes)