PROBLEM SET 10 (DUE ON THURSDAY, NOV 17)

(All Exercises are references to the August 29, 2022 version of *Foundations of Algebraic Geometry* by R. Vakil.)

Problem 1. Exercise 10.2.J (distinct morphisms remain distinct upon extending the base field)

Problem 2. Describe two morphisms $\mathbb{A}^1_{\mathbb{C}} \to \mathbb{A}^1_{\mathbb{C}}$ such that the fiber product $X = \mathbb{A}^1_{\mathbb{C}} \times_{\mathbb{A}^1_{\mathbb{C}}} \mathbb{A}^1_{\mathbb{C}}$ using these morphisms has exactly two irreducible components and such that the two irreducible components intersect in exactly two points.

Problem 3. Exercise 10.3.F (blowing up a point in $\mathbb{A}^2_k$)