MATH 721, Algebra II
Exercises 6
Due Fri 22 Feb

Exercise 1. Prove Proposition 5.8.2 from the notes.

Exercise 2. Let k be a field and let $k(x)$ be the function field over k in one variable. Let $a, b, c, d \in k$ such that $ad - bc \neq 0$. Show that there is a unique k-isomorphism $\phi\colon k(x) \to k(x)$ such that $\phi(x) = \frac{ax+b}{cx+d}$.

Exercise 3. Let k be a field and let $k(x)$ be the function field over k in one variable. Let $\phi\colon k(x) \to k(x)$ be a k-isomorphism. Show that there exist $a, b, c, d \in k$ such that $ad - bc \neq 0$ and $\phi(x) = \frac{ax+b}{cx+d}$.