

Math 553, Lesieutre  
Problem set #6  
due February 26, 2016

1. This chapter introduced several different groups of divisors on a scheme ( $\text{Div } X$ ,  $\text{Cl } X$ ,  $\Gamma(X, K^*/\mathcal{O}^*) \dots$ ). List them. For each, what sorts of schemes is it defined for? What are the natural maps between them, and in what situations are these maps isomorphisms?
2. II.5.10
3. II.6.5
4. II.6.6
5. II.6.8
6. Compute the Picard group of  $\mathbb{P}^{n_1} \times \mathbb{P}^{n_2} \times \dots \times \mathbb{P}^{n_r}$ . Describe generators of this group.
7. Show that  $\mathbb{P}^2$  is not isomorphic to  $\mathbb{P}^1 \times \mathbb{P}^1$ .