

5 Sheaves of Modules

5.1 \mathcal{O}_X -modules

6 Cohomology

7 Riemann-Roch and Serre duality

7.1 Divisors on curves

Let X be regular integral projective scheme of dim 1 over a field k

Prop. *If D is the effective divisor associated to a fin closed subscheme:*

1. $T \subset X$ then $D = \sum_{P \in T} \text{length}(\mathcal{O}_{T,P} \cdot P)$
2. and $\deg_k(D) = \sum_{P \in T} \text{length}(\mathcal{O}_{T,P}) \cdot [k(P)/k] = \dim_k \Gamma(T, \mathcal{O}_T) \stackrel{4.8}{=} \deg(T)$

Prop. *If k' is a fin extension of $k \Rightarrow \deg_k(D) = \deg_{k'}(D) \cdot [k'/k]$*

Prop. *For any field extension k'/k let $X' := X_{k'} = X \times_{\text{Spec}(k)} \text{Spec}(k') \xrightarrow{\pi} X$
Assume X' integral then $\deg_{k'}(\pi^*D) = \deg_k(D)$*

Prop. *Theorem asdf*

Prop.