

Math 724: Problem Set 7

Due on 11.28.06

1. Show that the definition of the fibre over a maximal ideal $P \subset R$ is equivalent to that for the fibre over a prime ideal $P \subset R$, when the prime is maximal.
2. Let $R = \mathbb{C}[t]$ and $S = R[x]/(x^3 - t)$. Let $\phi : R \rightarrow S$ be the map that sends t to t and turns S into an R -module.
 - (a) Draw a picture of the family this map represents algebraically.
 - (b) Find the fibre over each prime ideal P in R .
 - (c) Is S flat over R ? Prove your answer.
3. Let R be a ring. Prove that $R[U^{-1}]$ is flat over R , for any multiplicatively closed $U \subset R$. This is in the book if you need to look it up.
4. Exercise 6.1 a, p. 170.