Math 250B. Homework Exercises #9

Due Friday 3 April, online

1. Do Exercise 4.17 of Eisenbud (page 138). Use the hint (this is a requirement).

2(nc). Do Exercise 4.18 of Eisenbud.

3(nc). Let $R$ be a ring and $M$ a finitely generated $R$-module. Show that if $M/PM = 0$ for all maximal ideals $P$ of $R$, then $M = 0$.

4. Let $R$ be a ring. Show that the following conditions are equivalent:
   
   (i). $R$ is a Jacobson ring;
   
   (ii). For all $b \in R$, all maximal ideals of $R[b^{-1}]$ come from maximal ideals of $R$. 