Math 256A. Problem Set #8

"Due" Thursday, 29 October—do not hand in

1. Exercise 1.3a.

2. Let Z, X, and $\mathscr{F}$ be as in the definition of $\mathscr{F}\big|_Z$ on page 65. Show that the stalk of $\mathscr{F}\big|_Z$ at any point $P \in Z$ is just $\mathscr{F}_P$ (as indicated in the last sentence of that definition).

3. Exercise 1.8.

4. Exercise 1.17.

5. Let X be a noetherian topological space, and let $\mathscr{F}$ be a subsheaf of the constant sheaf $\mathbb{Z}$ on X. Show that $\mathscr{F}$ is finitely generated; i.e., that there are open subsets $U_1, \dots, U_n$ of X and sections $s_i \in \mathscr{F}(U_i)$ for all i such that no proper subsheaf of $\mathscr{F}$ contains all of these sections. [**Hint:** First show that for all $P \in X$ the stalk $\mathbb{Z}_P$ equals $\mathbb{Z}$, and then consider the sets $\{P \in X : i \in \mathscr{F}_P\}$ for $i \in \mathbb{Z}$.]