Homework 12

1. Give an example of a finite noncommutative ring. Give an example of an infinite noncommutative ring that does not have a unity.

2. is $\mathbb{Z}_6$ a subring of $\mathbb{Z}_{12}$? Explain.

3. Suppose that $R_!, R_2, ..., R_n$ are rings that contain nonzero elements. Show that $R_1 \oplus \cdots \oplus R_n$ has a unity if and only if each R_i has a unity.

4. Let R be a commutative ring with unity and let $U(R)$ denote the set of units of R. Prove that $U(R)$ is a group under the multiplication of R. (This group is called the *group of units of* R).