

Homework 2, due Wednesday Sept 23.

NAME:

Mark the squares that are followed by correct statements.

- ☐ If M is a submodule of N and N a submodule of K , then M is a submodule of K .
- ☐ Any finitely-generated module over a ring R is a quotient of a free module R^n .
- ☐ The $\mathbb{Q}[x]$ -module $\mathbb{Q}[x]/(x^2 - x)$ is simple.
- ☐ The $\mathbb{C}[x]$ -module $\mathbb{C}[x]/(x + \sqrt{2})$ is simple.
- ☐ The \mathbb{Z} -module $\mathbb{Z}/33\mathbb{Z}$ is simple.
- ☐ Direct sum of two simple modules is simple.
- ☐ Any division ring is commutative.
- ☐ A module over a field is cyclic if and only if it is simple.
- ☐ If a module has no proper submodules, it is simple.
- ☐ Any left ideal of a ring R is a left R -module.
- ☐ Direct sum of two cyclic modules is cyclic.
- ☐ A quotient module of a cyclic module is cyclic.

2. Give an example of a \mathbb{Z} -module which has exactly three proper submodules.