

**Fall 2018, Math 320: Week 6 Preliminary Problems**  
**Due: Thursday, October 4th, 2018**  
**Isomorphisms and Homomorphisms**

**Preliminary problems.** These problems should be completed before discussion on Thursday.

(P1) Suppose  $R$  and  $S$  are rings, and  $\phi : R \rightarrow S$  be any function. Write down the requirements for  $\phi$  to be an isomorphism.

(P2) Indicate with an (H) which requirements above are needed for  $\phi$  to be a homomorphism.