**Winter 2018, Math 148: Week 2 Preliminary Problems**
**Due: Thursday, January 18th, 2018**
**Groups, Rings, and Fields**

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

(P1) List all of the requirements for $(F, +, \cdot)$ to be a field (i.e. from the definition). Do not use the words "group" or "ring" anywhere in your list. Write out the meaning of words like "commutative" and "associative" if you use them.

(P2) Write "(G)" next to each item above that is needed to ensure $(F, +)$ is an Abelian group.

(P3) Write "(R)" next to each axiom item that is needed to ensure $(F, +, \cdot)$ is a ring.