

## Homework

due on Friday, January 28

Read carefully Chapter 1 in the book.

**Problem 1.** Using only the axioms and the 12 properties proved in class prove that:

- a) If  $a$  satisfies  $a^2 = a$  then either  $a = 0$  or  $a = 1$ .
- b) If  $ab = a$  and  $a \neq 0$  then  $b = 1$ .
- c)  $(a - b)(c - d) = (ac + bd) - (ad + bc)$  for any  $a, b, c, d$ .
- d)  $(a-b)+(c-d)=(a+c)-(b+d)$

Explain in details each step of your reasoning.