# Assignment 1 in Advanced Calculus I (Math 409)

due to Sept 5 2008

1. Prove that for a field the following two statements hold:
   a) If $x \cdot y = 0$, then either $x = 0$ or $y = 0$;
   b) $(-x) \cdot (-x) = x \cdot x$;
2. Prove that for an ordered field the following two statements are valid
   a) $a < 0, b > 0 \Rightarrow a \cdot b < 0$;
   b) $a < 0, b < 0 \Rightarrow a \cdot b > 0$;
3. Prove that in the axioms of an ordered field, given in the class (and also in the textbook on p.4), the multiplicative property of order can be replaced by the following property: $a > 0,\ b > 0 \ \Rightarrow \ ab > 0$ (i.e. with this replacement we get an equivalent system of axioms).
4. p. 12 Exercize #4 in the textbook.
5. p. 12 Exercize #5$(b), (c)$ in the textbook.
6. p. 23 Exercize #1$(c), (e), (f), (g)$ in the textbook.
7. p. 23 Exercize #5$(a)$ in the textbook.