Homework # 4 (Due August 29).

Read pp. 8-18 in the textbook.

Do the following problems:

1. Prove the reverse triangle inequality

$$|x-y| \geq \big||x|-|y|\big|, \quad x, y \in \mathbb{R}.$$

(Hint: Rewrite this inequality in an equivalent form as $\ldots \leq |x|-|y| \leq \ldots$ Then apply triangle inequality. Do not consider cases.

2. Prove that if $|x-c| < \frac{|c|}{2}$ for $x, c \in \mathbb{R}$, then $|x| > \frac{|c|}{2}$. (Hint: Write $|c| = |c-x+x|$ and apply triangle inequality).

3. Do exercises 1.2.10 and 1.2.11 in the textbook.