Math 215: Introduction to Advanced Mathematics

Problem Set 2

Due Friday September 14

Do pg. 54: 6

1) Prove that in any group $(a^{-1})^{-1} = a$.

2) Suppose G is a group with the additional property that if $a, b, c \in G$ and $a * b = c * a$, then $b = c$. Prove that G is commutative, i.e., prove that $a * b = b * a$ for all $a, b \in G$.

3) Recall that

$$|a| = \begin{cases} a & \text{if } a \geq 0 \\ -a & \text{if } a < 0 \end{cases}.$$

Prove that

$$|a + b| \leq |a| + |b|$$

for all a and b. [Hint: You might want to consider 4 cases depending on whether each of a and b is negative or nonnegative.]