Mathematics 216
Robert Gross
Homework 13
Due February 24, 2012

1. Suppose that a, b, and c are positive integers, where $a|c$, $b|c$, and $(a, b) = 1$. Prove that $ab|c$.

2. Let n be a nonnegative integer, and a any positive real number. Prove that

$$\int_0^1 x^a (\log x)^n \, dx = \frac{(-1)^n n!}{(a+1)^{n+1}}.$$

3. Suppose that a and b are complex numbers. Prove that

$$|a - b| \geq |a| - |b|$$

by using the triangle inequality.