**Math 215: Introduction to Advanced Mathematics**

Problem Set 1

**Due Tuesday Jan 30**

1. Do pg. 54: 8

2. Prove:
   $\frac{a}{b} > \frac{c}{d}$ if and only if $\frac{a}{a+b} > \frac{c}{c+d}$.

   What does this formal argument tell us about the two ways discussed in class of solving the 'How juicy is it' worksheet?

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

   Prove that $|a + b| \leq |a| + |b|$ for all real numbers $a$ and $b$. You may want to consider four cases depending on whether each of $a$ and $b$ is negative or nonnegative.