MATH 642:491–Fall, 2008

Problems to be discussed October 28

Larsen, 7.1.8, 7.1.10, 7.1.12, 7.2.7, 7.3.7, 7.3.8, 7.3.9, 7.6.14

1. Prove: For any two real numbers x, y, if $y \geq 0$ and $y(y+1) \leq (x+1)^2$ then $y(y-1) \leq x^2$.

2. Find the smallest positive integer n such that for every integer m with $0 < m < 1993$, there exists an integer k for which $m/1993 < k/n < m + 1/1994$.

3. Let $a_1, a_2, ..., a_n$ and $b_1, b_2, ..., b_n$ be nonnegative real numbers. Show that

$$(a_1 a_2 ... a_n)^{1/n} + (b_1 b_2 ... b_n)^{1/n} \leq ((a_1 + b_1)(a_2 + b_2)...(a_n + b_n))^{1/n}.$$