Name: _

Math 378 Spring 2011 Bonus Questions 1

1. Find a sequence of 16 distinct real-numbers with neither an increasing subsequence of length 5 nor a decreasing subsequence of length 5.

2. Show $K_{17} \to K_3, K_3, K_3$.

3. Show $K_{10} \to K_3, K_4$.

4. Show $K_9 \to K_3, K_4$. The two cases from the previous part apply here, but there is also another case. Show that the extra case is actually impossible (this may require a little idea from graph theory).

5. Use Ramsey's theorem to prove that there exists a positive integer N such that every sequence of N distinct real numbers has either an increasing subsequence of length n or a decreasing subsequence of length n.