



PUTNAM EXAM SEMINAR
FALL 2012

QUIZ 2
SEPTEMBER 12

Problem 1. Given any thirteen real numbers, prove that there are two of them, say x and y , so that

$$0 < \frac{x - y}{1 + xy} < \sqrt{\frac{2 - \sqrt{3}}{2 + \sqrt{3}}}.$$

Problem 2. Given a set of $n + 1$ positive integers, none of which is greater than $2n$, prove that at least two of the integers are relatively prime.

Problem 3. A college senior is studying for the MCAT, which is 11 weeks away. She decides to study at least an hour a day, but no more than 12 hours in any week. Show that there is a sequence of consecutive days in which the senior studies exactly 20 hours.