

MATH601 Spring 2008
Exam 1: Natural Numbers

Please read all directions carefully. For this exam, you may not use any books, notes, or other aids apart from a calculator. Please write all solutions clearly and legibly, on separate paper, indicating what work applies to which problem. Cross out incorrect statements, this may improve your grade. Your grade on each problem will be from twenty-five to fifty points. If you wish, you may revise one of these problems for extra credit, due on Monday February Eleventh. Your grade on this problem will become the average of your original grade and the revised grade, rounded down. You have 35 minutes; good luck!

- A. Write nineteen and one hundred in senary, then multiply the results using the Russian Peasant method.
- B. Given a five-hand number n , let m be the alternating sum of the hands of n (adding the leftmost, middle, and rightmost hands, and subtracting the two others). Prove that seven divides n if and only if seven divides m .