



2009-2010 Puzzle Contest #4

First Name _____ Last Name _____ Grade _____



Grades 5 and Up Puzzles:

1. FIND THE PERFECT DIGITS

Find all pairs of non-zero digits y and z for which the product $3 \cdot \overline{yyyy} \cdot \overline{zzzz}$ is a perfect square. (\overline{qqqq} is the 4-digit number with the same digit q) **20 points**

2. THE SIMPLE GAME WITH PEBBLES

A heap of pebbles is collected on a beach by two boys for the following game: boys take pebbles from the heap in turn; each of them may take 1, 2, or 3 pebbles. The winner of the game is the one who takes up last pebble. For what initial number of pebbles will the player who starts first be a guaranteed winner of the game for any moves of his opponent? What is a winning strategy of this game for him in these cases? **50 points**

3. PERSISTENT TRAVELERS

Two travelers started at dawn. Each of them walked with a constant speed. One of them went from A towards B; the other one went from B towards A. They met at 11 AM, and went on walking without stopping. The first traveler came to B at 3 PM; the second one came to A at 8PM. What time was dawn that day?

30 points

Submission Deadline is March 20.

Solutions can be emailed to anna@metrowestschool.com, deposited into the Tuition Box in the office, or mailed to us or deposited into our Mailbox