








## 2017-2018 Puzzle Contests

# Contest #4



### Parents and Grandparents Puzzles:

1. A black Rook and the white King are arranged on an 8 x 8 chess board so that the Rook threatens the King but the King does not threaten the Rook. How many of such (different) positions of the King and the Rook are possible? (The positions are identical if they can be obtained from each other by a rotation of the board) **(25 pts.)**
2. On the Island of Eternal Love the alphabet consists of just two letters  and . In addition no word in its language has two consecutive letters , and no word is longer than 8 letters. How many possible words are there in the language of the Island of Eternal Love? **(35 pts.)**
3. On Valentine's Day, citizens of the Island of Eternal Love like to play the following word game. The letters  and  are placed in the cells of a 100 x 100 table. A player is allowed to change any letter in any cell, but if the letter is changed, then all the letters in the corresponding column and row must also change its state on that move. If all cells in the table are initially filled with letter , it possible to come up with a sequence of moves that will result a table with exactly 2018 letters  after some number of moves? Why or why not? **(40 pts.)**

Solutions deadline is March 18

Please submit your solutions to [anna.charny@metrowestschool.com](mailto:anna.charny@metrowestschool.com)  
or bring them to the office