Bergen County Mathematics League

Good Luck To You

Good Luck To All

Contest #5 (No Calculators) **2013-2014**

Part I *Time Limit: 12 minutes*

On contest #6, ***any S.A.T. calculator will be allowed.***

5-1. What are all values of x which satisfy $\sqrt{x} - \sqrt{1} = x - 1$?

5-2. What are the coordinates of the reflection of (6,0) across the line $y = 3x$?

Part II *Time Limit: 12 minutes*

5-3. Three students each start a game with a pile of money. The loser gives to each of the other two an amount of money, from his own pile, that doubles the amount of money in that player's pile. After three such games, each has lost just once and each has \$24. What are the three amounts of money with which the students began? [.sdrawkcab kroW :TNIH]

5-4. Let $f(x) = 2^x$. Rounded to 7 significant digits, my calculator's display shows $f(0.119) = 1.085982$ and $f(0.120) = 1.086735$. Based on this information, what value should I expect to get if I similarly round my calculator's display of $f(0.1195)$?

Part III *Time Limit: 12 minutes*

5-5. What is the ordered pair of positive integers (A,B), given that A is the sum of some of the numbers in $S = \{1,3,9,27,81,243,729\}$, B is the sum of some numbers in S different from those used to get A, and $A - B = 500$?

5-6. What is the area of a trapezoid the lengths of whose bases are 10 and 16 and the lengths of whose legs are 8 and 10?

***Reminder*: A question next meet will repeat the theme of question 5-1.**

Answers

5-1. 0, 1

5-2. (-4.8,3.6)

5-3. \$12, \$21, \$39

5-4. 1.086358

5-5. (756,256)

5-6. 104