Bergen County Mathematics League

Good Luck To You

Good Luck To All

Contest #3 (No Calculators) **2013-2014**

Part I *Time Limit: 12 minutes* On contests #4 and #6, ***any S.A.T. calculator will be allowed.***

3-1. The coordinates of the midpoints of two adjacent sides of a square are (3,-5) and (-1,-1). What is the area of the square?

3-2. Everyone in a group of people speaks at least one of the Romance languages French, Spanish, and Italian. If 22 speak Spanish, 23 speak French, 17 speak Italian, 8 speak Italian and Spanish, 7 speak Italian and French, 11 speak French and Spanish, and 3 people speak all three languages, how many people are in the group?

Part II *Time Limit: 12 minutes*

3-3. Let brackets denote the greatest integer function, so that [x] is the only integer satisfying $x - 1 < [x] \leq x$. For example, $[\frac{1}{2}] = 0$ and $[-\frac{1}{2}] = -1$. What is the smallest integer $n > 0$ for which $[n\pi] \neq n[\pi]$?

3-4. To the nearest tenth, what is the value of $\sqrt{11 + 6\sqrt{2}} - \sqrt{11 - 6\sqrt{2}}$?

Part III *Time Limit: 12 minutes*

3-5. If $f(x) = x^5 + x^3 + x + 1$, what is the value of $f(2013) + f(-2013)$?

3-6. The lengths of the diagonals of a rhombus are 30 and 40. What is the area of a circle inscribed in this rhombus?

***Reminder*: A question next meet will repeat the theme of question 3-2.**

Answers

3-1. 64

3-2. 39

3-3. 8

3-4. 2.8

3-5. 2

3-6. 144π