

Bergen County Mathematics League

Good Luck To You



Good Luck To All

Contest #1 (No Calculators)

2011-2012

Part I *Time Limit: 12 minutes* On contests #2, #4, and #6, any S.A.T. calculator will be allowed.

1-1. The roots of $x^3 + 4x^2 - 7x - 10 = 0$ are -5, -1, and 2. What are the roots of $(x-2011)^3 + 4(x-2011)^2 - 7(x-2011) - 10 = 0$?

1-2. As Al and Bill approached each other from starting points 1 mile apart, Al's dog ran back and forth between the two men. Each man walked at a rate of 2 miles per hour. The dog ran at the rate of 12 miles per hour. How many miles did the dog run before Al and Bill met?

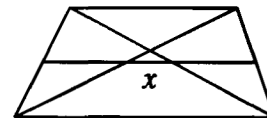
Part II *Time Limit: 12 minutes*

1-3. Which percent fit is greater:
A) a square peg that fits snugly into a round hole, or
B) a round peg that fits snugly into a square hole?

1-4. What is the common root of $x^2 - 294x + 21600 = 0$ and $x^2 - 304x + 23040 = 0$?

Part III *Time Limit: 12 minutes*

1-5. In the trapezoid at the right, which is not drawn to scale, if the shorter base is 14 and the longer base is 30, how long is the part of the median that lies between the trapezoid's diagonals?



1-6. What is the greatest integer that leaves the same remainder when divided into 460, 768, and 999?

Notice: A question next meet will repeat the theme of question 1-6.

Answers

1-1. 2006, 2010, 2013

1-2. 3 or 3 miles

1-3. B or round peg in a square hole

1-4. 144

1-5. 8

1-6. 77