# Nassau County Interscholastic Mathematics League

**Contest # 4** 1999-2000

**Answers must be exact or must have 4 (or more) significant digits, correctly rounded, unless otherwise noted**

Team Problems 35 minutes

T1. How many distinct scalene triangles are there with integer sides and perimeter less than 13 ?

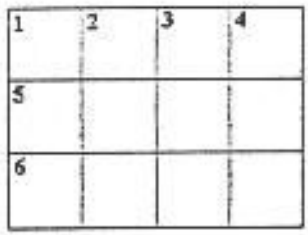
T2. The smaller base of a frustum of a cone has radius 3 and the larger base has radius 5. The lateral segment between the bases has length 6. Find the volume of the frustum..

T3. Find the exact distance between the parallel lines $y = 2x - 1$ and $y = 2x + 9$. **Do not approximate.**

T4. A row of chairs is numbered #1, #2, #3, #4, #5 in that order. You are originally in chair #1. On each move you stand up and sit down in an adjacent chair Make 215 moves. Then remove chair #1 and chair #5. Now make 285 more moves. On what chair number are you sitting?

T5. A standard, fair six-sided die is rolled repeatedly until a "5" occurs. Find the expected number of rolls required.

T6. Complete the cross-number puzzle at right in which each across answer is a four-digit positive integer and each down answer is a three-digit positive integer. [Note: the grid at right is for scratch work only. Write your answer in the answer space as a 3 by 4 array of numbers (just as they appear in the grid)]




Across

1. A multiple of 9 with digits strictly increasing
5. A multiple of 9.
6. A cube of a prime.

Down

1. A multiple of 11
2. The number of digits in the cube of a googol
3. The digits are in arithmetic progression
4. A Fibonacci number