

# Bergen County Mathematics League

Good Luck To You



Good Luck To All

**Contest #1 (No Calculators)**

**2010-2011**

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

1-1. A group of 600 students exactly fill the seats in a rectangular array of columns and rows. If 4 rows were removed and replaced by 5 new columns, then the students would still exactly fill the new seating arrangements. How many seats are in each column?

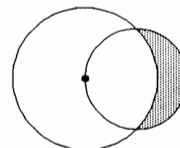
1-2. Write a repeating decimal equal to the sum of the repeating decimals  $0.\overline{1} + 0.\overline{12} + 0.\overline{123}$ .

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**Part II** *Time Limit: 12 minutes*

1-3. A pile of quarters, nickels, and dimes is worth \$101. There are 5 times as many dimes as quarters, and 20 more nickels than dimes. How many nickels are there in the pile of coins?

1-4. The center of a circle of radius-length  $\sqrt{2}$  lies on a circle of radius 1, as shown in the diagram at the right. What is the area of the small shaded lune formed by the two circles?



**Part III** *Time Limit: 12 minutes*

1-5. What is the smallest multiple of 9 all of whose digits are even?

1-6. Write  $\frac{12}{\sqrt{5} + \sqrt{3} + \sqrt{2}}$  in simplest radical form.

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

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## Answers

1-1. 25

1-2.  $0.\overline{355446}$

1-3. 520

1-4. 1

1-5. 288

1-6.  $3\sqrt{2} + 2\sqrt{3} - \sqrt{30}$  (order of terms is not important)