

**Nassau County Interscholastic Mathematics League**

**Contest # 1**

**Answers must be in simplest exact form, unless otherwise noted.**

**2004-2005**

**No Calculators**

Problems 1-2 Time limit: 10 minutes.

- 1) Assume that  $x$  can be any real number other than 1 or 1.2, and  $y$  is not zero.

Solve the equation below for  $y$  in terms of  $x$ :

$$\frac{x}{y} + 5x = 6 + \frac{1}{y}.$$

- 2) The first three terms of a geometric sequence are  $x - 3$ ,  $x - 1$ , and  $3x - 7$ . Find all possible numerical values of the fourth terms of the sequence.
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Problems 3-4 Time limit: 10 minutes.

- 3) How many six-digit numbers can be formed using the digits 1, 2, 2, 3, 3, and 4 which are greater than 343122?
- 4) For how many of the eight possible combinations of truth values for the statements  $p$ ,  $q$ , and  $r$ , will the statement  $p \vee (q \wedge \sim r)$  be true?
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Problems 5-6 Time limit: 10 minutes.

- 5) Pirandello's Pizza charges the same price for each square inch of pizza. If a 6 inch diameter pizza sells for \$12.40, what is the price of a 9 inch diameter pizza?
- 6) If the diagonal of a rectangle has length 14 feet, and the area of the rectangle is 64 square feet, find the number of feet in the perimeter of the rectangle.
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Answers.

1)  $y = \frac{x-1}{6-5x}$

2) 1,16

3) 32

4) 5

5) \$27.90

6) 36