Nassau County Interscholastic Mathematics League

Contest #2 **Answers must be in simplest exact form, unless otherwise noted.** **2004-2005**

Calculators

Problems 7-8 Time limit: 10 minutes.

7) The vertices of a triangle are at coordinates $(-1,4),(3,12)$ and $(7,\text{-}2)$. Find the area of the triangle.

8) Let p, q, and r be statements. Of the eight possible cases of truth values for the statements, for how many will the statements $\sim(p \wedge (q \vee r))$ and $(p \wedge q) \vee (p \wedge r)$ have the same truth value

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Problems 9-10 Time limit: 10 minutes.

9) A set of fifteen cards each has a different whole number from 1 to 15. Three different cards are drawn from the deck. Find the probability that the sum of the three numbers drawn is 10. Write your answer as a fraction in lowest terms.

10) In right triangle MAT, H is on hypotenuse $\overline{MT}$ such that $\overline{AH}$ is an altitude of the triangle. If MA = 4 and HT = 6, find length of $\overline{AT}$ to the nearest thousandth.

Problems 11-12 Time limit: 10 minutes.

11) The quadratic expression $x^2 + ax + 6$ can be factored into the product of two linear binomials with integer coefficients. Find all possible values of a.

12) Points $A(-1,4), B(3,12)$ and $C(7,\text{-}2)$ are given. Find (to the nearest tenth of a degree) the measure of $\angle BAC$.

Answers:				
	7)	44	8)	0
	9)	$\frac{4}{455}$	10)	6.928
	11)	$7, -7, 5, -5$	12)	100.3°