

Nassau County Interscholastic Mathematics League

Contest #3

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

2008-2009

No calculators are allowed.

Time: 10 minutes

13. The odometer reading of a car shows that the number of miles it has been driven is 15951, which is a numerical palindrome, meaning the number reads the same forward and backward. After two hours of being driven at a constant speed, its odometer reading is the next greater numerical palindrome. How fast, in miles per hour, was the car driven over the two-hour interval?

14. Compute the area of the region enclosed by the graph of $|x| + |y| = 10$.

Time: 10 minutes

15. If a and b are positive integers, for how many ordered pairs (a, b) is it true that $4a + 3b = 937$?

16. In isosceles trapezoid ABCD, base \overline{AB} measures 52 cm and base \overline{DC} measures 28 cm. Diagonal \overline{DB} measures 41 cm. Compute the absolute value of the difference between the number of square centimeters in the area of the trapezoid and the number of centimeters in the perimeter of the trapezoid.

Time: 10 minutes

17. If x and y are positive real numbers such that $x + y = 21$, compute the minimum value of $\frac{1}{x} + \frac{1}{y}$.

18. The sum of the consecutive integers from -7 to x inclusively is 297. Compute x .