

# Nassau County Interscholastic Mathematics League

Contest 1      Answers must be in simplest exact form, unless otherwise specified.      2006 – 2007

No calculators

Problems 1-2. Time limit: 10 minutes

#1. The lengths of one pair of opposite sides of a rectangle are  $y$  and  $2x - 3$ . The lengths of the other pair of opposite sides of the rectangle are  $16x + 25$  and  $2y^2 + 7$ . Compute the perimeter of the rectangle.

#2. The weekly math quizzes are scored from 0 through 100, inclusive. If Adam has scored 84 and 76 on the first two quizzes, what is the lowest possible score he can receive on the third quiz and still average exactly 81 for the first five quizzes?

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Problems 3-4. Time limit: 10 minutes

#3. The average of  $x$ ,  $y$ , and 70 is 15 more than the average of  $y$ ,  $z$ , and 58. Compute the value of  $x - z$ .

#4.  $\triangle OBC$  has vertices  $O(0,0)$ ,  $B\left(\frac{a}{2}+1, \frac{a}{2}-1\right)$  and  $C(a,0)$ . If  $a$  is positive, the area of  $\triangle OBC$  is 12 and  $D$  is the foot of the altitude  $\overline{BD}$  of  $\triangle OBC$ , compute the area of  $\triangle OBD$ .

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Problems 5-6. Time limit: 10 minutes

#5. If  $3^{11} - 3^9 + 3^7 - 3^6 = 81x$ , compute  $x$ .

#6. The number shown, with the hundreds' digit missing, 62894\_\_52, is divisible by 48. Determine the missing digit.

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Answers:

#1. 224

#2. 45

#3. 33

#4. 7.5

#5. 1962

#6. 3