



# NEW ENGLAND MATHEMATICS LEAGUE

P.O. Box 6, Sharon, Massachusetts 02067-0006

All official participants must take this contest at the same time.

## Contest Number 1

Any calculator without a QWERTY keyboard is allowed. Answers must be exact or have 4 (or more) significant digits, correctly rounded.

October 13, 2015

Name \_\_\_\_\_ Teacher \_\_\_\_\_ Grade Level \_\_\_\_\_ Score \_\_\_\_\_

Time Limit: 30 minutes

NEXT CONTEST: NOV. 10, 2015

Answer Column

1-1. Each vertex of a square is assigned a different positive integer. If the numbers on the endpoints of each diagonal have the same sum, what is the least possible value of this sum?

1-1.

1-2. Every coin in my piggy bank has a face value of 50¢, 25¢, 10¢, 5¢, or 1¢. The bank contains many coins of each type. At most how much money can I withdraw from my piggy bank without being able to make change for \$1?

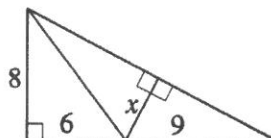


1-2.

1-3. What are all integers  $x$  for which  $|x^2 - 26x + 88|$  is a prime?

1-3.

1-4. In the big right triangle shown, the lengths of the legs are 8 and 15. How long is the line segment whose length is marked  $x$ ?



1-4.

1-5. Which integer  $> 1$  leaves the same remainder when divided into each of the numbers 1108, 1453, 1844, and 2281?

1-5.

1-6. What is the largest value of  $c$  for which exactly three different pairs of positive integers  $(x, y)$  satisfy  $5x + 7y = c$ ?

1-6.

Eighteen books of past contests, *Grades 4, 5, & 6 (Vols. 1, 2, 3, 4, 5, 6)*, *Grades 7 & 8 (Vols. 1, 2, 3, 4, 5, 6)*, and *HS (Vols. 1, 2, 3, 4, 5, 6)*, are available, for \$12.95 each volume (\$15.95 Canadian), from Math League Press, P.O. Box 17, Tenafly, NJ 07670-0017.