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 24, 2006**

Name _____ Teacher _____ Grade Level _____ Score ____

Time Limit: 30 minutes   NEXT CONTEST: NOV. 28, 2006   *Answer Column*
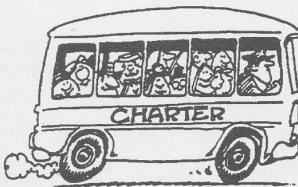
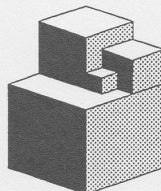|	
1-1. Which positive integer n satisfies $n^{2006} + 2n^{2007} = 3$?	1-1.
1-2. In non-equilateral isosceles triangle T, the length of each side is an integer. What is the least possible perimeter of T?	1-2.
1-3. Buses A and B always arrive on time: A every 16 minutes, B every 9 minutes. I take 6 minutes to walk to A's stop and 10 minutes to walk to B's. I leave at random times, and I always walk to the same stop. To which stop (A or B) should I walk to minimize the *expected* amount of time I'd take both to walk to that stop and to wait for a bus to arrive?	1-3.
1-4. As shown, four cubes (with respective volumes 1, 8, 27, and 125) are attached to each other in a way that minimizes the total surface area of the resulting configuration. What is the total surface area of this configuration?	1-4.
1-5. The equation $53 = (8 \times 5)+(8+5)$ shows how to represent 53 as the product plus the sum of the same two positive integers. What is the least integer greater than 53 which *cannot* be represented this way?	1-5.
1-6. If $x = 2^{12} \times 3^6$ and $y = 2^8 \times 3^8$, what integer z satisfies $x^x y^y = z^z$? (Note: Your answer should not be expanded. Instead, write your answer as a product of powers of primes.)	1-6.

© 2006 by Mathematics Leagues Inc.   Visit our Web site at www.mathleague.com