



2008-2009 Problems

Maine Mathematics Science and Engineering Talent Search

Round 4 (2008-2009) **Grades 9-12**

Deadline: (Postmark) February 10, 2009

Mail solutions to: MMSETS, P.O. Box 496, Orono ME 04473

NOTE: Please read and follow the GUIDELINES TO PREPARE SOLUTIONS (after the problems). Print out, complete and attach the cover sheet to your solution. The cover sheet is after the GUIDELINES

1. We were given the numbers

$$1 - x, 2 - x, 3 - x, \dots, 100 - x$$

(a) find the product of these numbers when $x = 77$

(b) find the sum of the numbers when $x = 50.5$

(c) show that the product would be the same if x takes up the value of 0 or 100.

2. A code is given in two columns. The entry on the right for any row is the coded version for the entry on the left. Determine the code entry for the fifth left entry.

Row	Left Entry	Coded Entry
1	623	674
2	284	518
3	1791	971
4	589	15
5	327	?

3. Mr. Hollenger drives to and from work over the same route each day. On Friday, he drives at an average rate of 52 km/hr and is one minute late to work. On

Monday, he drives at an average rate of 60 km/hr and is one minute early to work. If he left home at the same time each day, what is the distance Mr. Hollenger travels from home (one way) to work?

4. A five-digit perfect square in the form of $5abc6$ has a thousands digit a , hundreds digit b , and tens digit c . If a is less than or equal to b and b is less than or equal to c , what is the sum of $a + b + c$?

5. A circular park has a 9 miles diameter. The Vietnam Veteran's monument is located by entering the park from the northern most point and proceeding due south for 3 miles. Starting at the Vietnam Veteran's monument and going due west you would eventually reach the edge (circumference) of the park. At that point, if you go due south for 1.5 miles, you would reach the Civil War monument. As the crow flies, how far apart are the two monuments?

Questions? Please e-mail to evaszillery-mmsets@me.acadia.net

Guidelines to prepare solutions

- Purpose: The purpose of organized writing is to help you explore and understand important mathematical concept. Written communication is key to comprehension: you can best understand mathematical ideas by explaining them clearly in writing.
- Write at a classmate's level: Specifically, write in such a manner that one of your classmates who are unfamiliar with the problem could easily follow your work. Thus, your solutions should be a well-organized, lucid explanation of what you're doing. In particular: clearly label all drawings and graphs. Identify any variables you use and, when appropriate, give their units. Don't pull formulas out of a hat (give a reference).
- Strike a balance between English sentences and mathematical equations: If your paper contains mathematical "chicken scratches" it will be almost impossible for a reader to follow what you have done.
- Make your paper presentable: Your paper need not be word-processed, but should be clean and neat. Don't scribble.
- Get an early start: many problems are challenging and require some experimentation. Starting a solution the night before it's due is a very bad idea.
- Students in grade 6-9 can submit solutions to both problem sets (6-9 and/or 9-12).

Deadlines

In general the participants of the MMSETS will have three weeks to one month to prepare solutions. The deadlines of the seven rounds are as follows:

Round 1 November 11, 2008

Round 2 December 16, 2008

Round 3 January 13, 2009

Round 4 February 10, 2009

Round 5 March 10, 2009

The Honors Day is planned for April 1, 2009

These are the dates for postmarking the submissions; hence there is no need to utilize various special delivery services. We don't accept solutions submitted by e-mail.