A Question

In a particular area of France, three out of ten people have telephone numbers that are not listed in the phone book. If you choose 100 names from the directory at random, how many would have unlisted numbers?

A 200-Question, Campus-Wide Math Contest

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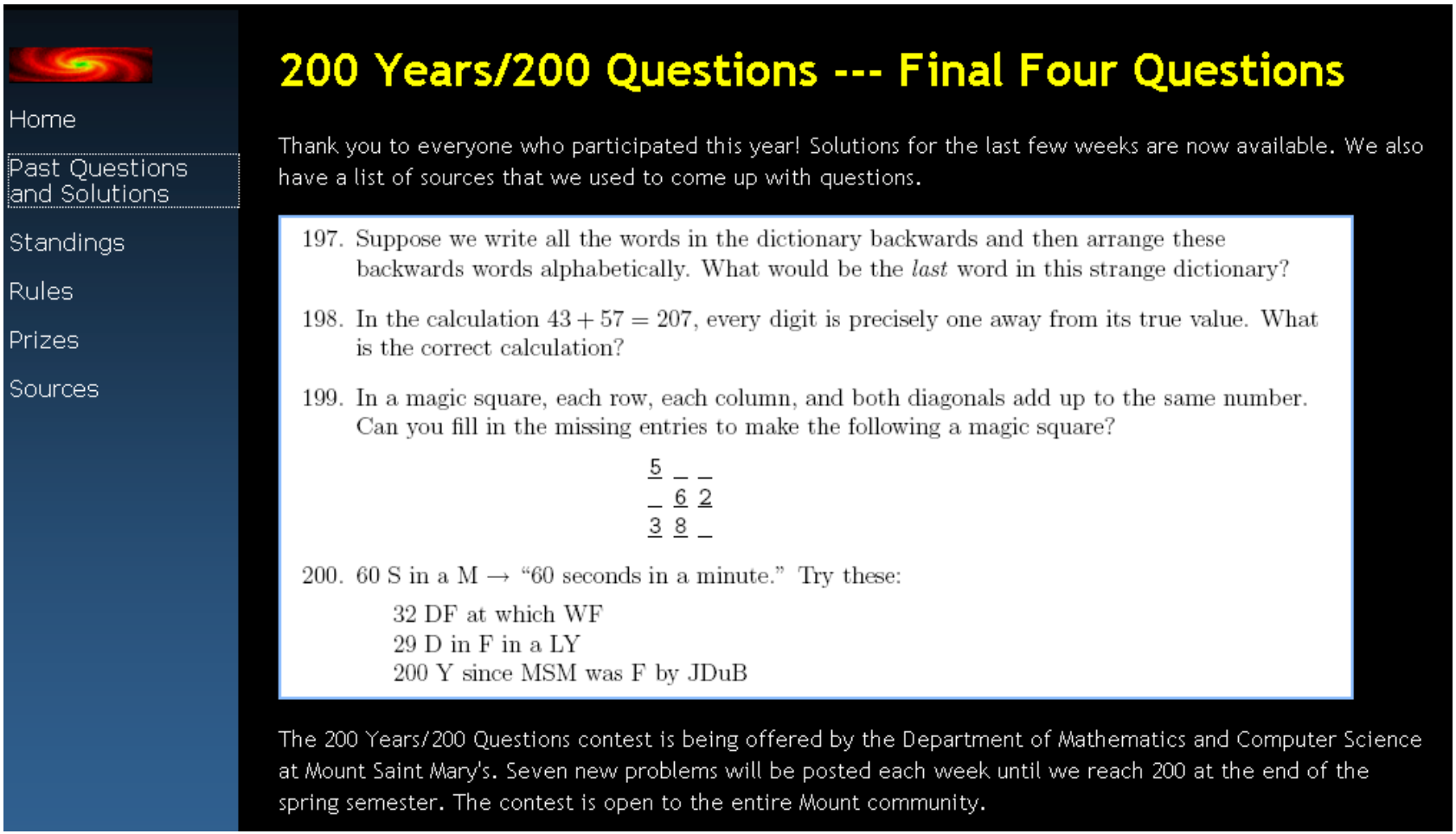
MAA MD-DC-VA Spring 2009
April 18, 2009

What Was It?

- Why? To celebrate MSM's Bicentennial
- 14 weeks $\times$ 7 questions $\times$ 2 semesters $=$ 196 questions
- Email campus Fridays with sample questions and link
- Answers to `contest@msmary.edu`
- I'd let them know correct/incorrect and offer hints
- About 10 days to answer questions
- Mondays – compile standings and post solutions
- Bulletin board and website – questions, standings, solutions

Screenshot



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Past Questions and Solutions

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Rules

Prizes

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200 Years/200 Questions --- Final Four Questions

Thank you to everyone who participated this year! Solutions for the last few weeks are now available. We also have a list of sources that we used to come up with questions.

197. Suppose we write all the words in the dictionary backwards and then arrange these backwards words alphabetically. What would be the *last* word in this strange dictionary?

198. In the calculation $43 + 57 = 207$, every digit is precisely one away from its true value. What is the correct calculation?

199. In a magic square, each row, each column, and both diagonals add up to the same number. Can you fill in the missing entries to make the following a magic square?

$$\begin{array}{ccc} 5 & \_ & \_ \\ \_ & 6 & 2 \\ 3 & 8 & \_ \end{array}$$

200. 60 S in a M $\rightarrow$ "60 seconds in a minute." Try these:

32 DF at which WF
29 D in F in a LY
200 Y since MSM was F by JDuB

The 200 Years/200 Questions contest is being offered by the Department of Mathematics and Computer Science at Mount Saint Mary's. Seven new problems will be posted each week until we reach 200 at the end of the spring semester. The contest is open to the entire Mount community.

Prizes

- Each semester:
  - \$38.16 to the overall winner(s)
  - \$20.08 to winners in Fresh/Soph, Jun/Sen, Math/CS
  - \$25 gift certificate to the community winner
- Top 10 finishers for the year each won \$25.
- Each month – drawing for two \$25 gift certificates.
  Each correct answer = +1 entry in that month's drawing.

The questions

- The most important part of a contest is good questions.
- Mount/Bicentenial-specific
- 2 easy questions, 3-4 easy/medium, 1-2 tricky
- Fun/interesting questions
- Solvable by non-math majors
- Math, logic, a few word puzzles, a few history questions

Non-mathematical questions

- There is at least one very common English word that has a fairly strange plural—the noun and its plural share no letters in common! What is this noun and its somewhat archaic plural?

- 4 is the only number in English with a certain property. Give any number in another language that also has this property.

- A snail falls to the bottom of a forty-foot well. It can crawl up the sides of the well at a rate of four feet each day, but each night it slides back three feet. At this rate, how long will it take the snail to climb out of the well?

Easy/Medium Math Questions

- Professor Petrelli sold two classic calculators for \$600 each. On one he had a 20% profit, while on the other he had a 20% loss. Did he make money or lose money? How much?
- Find a 3-digit number that is equal to the sum of the cubes of its digits.
- Find nine different 6-digit numbers which are all divisible by 7, 11, and 13.
- One laser blast will break asteroids larger than 20 kg into three pieces, each one third of the mass of the original. Asteroids smaller than 20 kg are shattered into dust by the laser. How many laser blasts would be required to reduce a 2000 kg asteroid to dust?

Trickier Questions

- At 12 noon, the minute and hour hands of a clock are perfectly lined up. They next line up a little after 1:05pm. Precisely how many seconds after 1:05pm will it be?

- What is the largest number that can be obtained as a product of positive integers that add up to 100? There is no restriction on how many integers.

- Compute $3 + 33 + 333 + \cdots + \underbrace{333\cdots3}_{n}$

Sources of Questions

- Colleagues
- 3 problems sent in by participants
- Myself

- *Mathematical Bafflers.* Angela Dunn
- *Second Book of Bafflers.* Angela Dunn
- *Mathematical Quickies.* Charles W. Trigg
- *500 Mathematical Challenges* - Barbeau, Klamkin, Moser
- *Riddles of the Sphinx.* David J. Bodycombe
- *Car Talk Puzzlers*
- *Mindtrap* (game by Pressman Toy Corp)

More Sources and Inspirations

- *Monthly*, *CMJ*, *Math Magazine*, Pi-Mu-Epsilon journal
- Lehigh University High School Math Competition
- Montclair State University Bi-Weekly Math Contest
- AHSME
- Northern Colorado Math Contest
- MAA-NJ section contest
- Games Magazine. http://www.gamesmagazine-online.com/
- 1000 PlayThinks. Moscovich
- Exploratory Problems in Mathematics. Stevenson
- Mathematical Recreations. Kraitchik
- Problem Solving Through Recreational Mathematics. Averbach and Chein

More Sources and Inspirations

- The Math Chat Book. Morgan
- Problem-Solving Through Problems. Larson
- My Best Mathematical and Logic Puzzles. Gardner
- Computers and the Imagination. Pickover
- Linear Algebra: A Modern Introduction. Poole
- More Mathematical Puzzles of Sam Lloyd
- Mother Tongue: English and how it got that way. Bryson
- A collection of word oddities and trivia. Jeff Miller. http://jeff560.tripod.com/words.html.

Results

110 people, 2187 correct responses, avg 20 people per week – students, alums, staff, seminarians, administrators, professors

1. 200 - Math and CS major
1. 200 - Math and CS alum
3. 131 - Bio major
4. 101 - Math major
5. 96 - Psych prof
6. 94 - Media Center technician
7. 78 - Dean of continuing studies
8. 71 - Theology prof
8. 71 - Math major
10. 62 - Math major

Time Per Week

- Comparable to teaching a course
- Coming up with questions: 3-4 hours per week
- Responding to answers: 2-3 hours
- Writing solutions: 1-2 hours
- Keeping score: 1 hour
- Website maintenance, etc.: 1 hour

Conclusions & Suggestions

- Be encouraging in replies
- Helps with math anxiety
- Good way to meet people
- Ingenious answers

One last question

What's the largest amount of money you can have in coins and still not be able to give change for a dollar?