Math Circles

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A Few Sample Math Circle Problems

4 Lockers in a row are numbered $1, 2, 3, \ldots, 1000$. At first, all the lockers are closed. A person walks by, and opens every other locker, starting with locker #2. Thus lockers $2, 4, 6, \ldots, 998, 1000$ are open. Another person walks by, and changes the "state" (i.e., closes a locker if it is open, opens a locker if it is closed) of every third locker, starting with locker #3. Then another person changes the state of every fourth locker, starting with #4, etc. This process continues until no more lockers can be altered. Which lockers will be closed and which will be open?

5 Here are the first few powers of 2:

$$1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024 \ldots$$

It should be easy to predict the ending digit. For example, what is the ending (rightmost) digit of 2^{2007}? But what about *starting* digits? Are there any patterns? Is there any power of 2 that starts with a 7? How about starting with a 9?

6 Which are there more of, perfect squares or primes? Does this question even make sense?

7 *Twin primes* are pairs of consecutive odd numbers that are prime. For example, 17 and 19 are twin primes. Also, 29 and 31 are twin primes. Is there an analogous notion of "triplet primes?" Why or why not?

What Are Math Circles?

▶ Inspired by the Eastern European problem-discussion approach to math education

▶ Education enrichment and outreach programs that bring mathematicians into direct contact with pre-college students

▶ Informal setting centered around interesting & challenging mathematical problems

▶ Style varies from circle to circle, but they all share level of excitement and joy in mathematics

Math Circles Across the Country

Bay Area Circles

▶ Berkeley Math Circle

▶ San Jose Math Circle

▶ San Francisco Math Circle

▶ Stanford Math Circle

▶ Oakland/East Bay Math Circle

▶ Oakland Math Circle

Sponsors

- S. D. Bechtel, Jr. Foundation

- Firedoll Foundation

- Moody's Foundation

- Simons Foundation

- Roger Strauch

. . . thanks to MSRI (especially Jim Sotiros)

San Francisco Math Circle

▶ Teachers bring students and get reimbursed for their time

▶ Teacher Circle

▶ Continuing Education credit

▶ College student TA's (enroll in a course)

National Association of Math Circles

mathcircles.org

▶ Database of Math Circles across the country

▶ Contact information for organizers

▶ Database of Math Circle speakers, web forums, ideas, etc.

▶ Protected information about Math Circle students

Circle In A Box

▶ Edited by Sam Vandervelde (founder of the Stanford Math Circle)

▶ Includes stories from successful program organizers, lesson plans, logistical advice, funding suggestions

▶ pdf copy at `mathcircles.org`

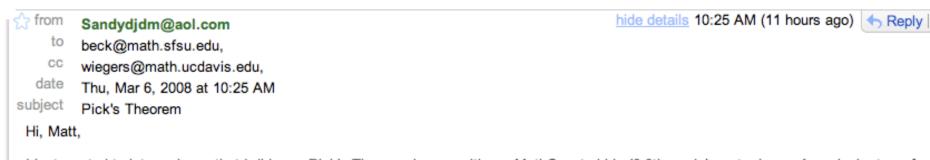CIRCLE IN A BOX

Events in the Near Future

▶ Math Circle Summer Teacher Training Institute (Notre Dame, July 6–12)

▶ How to run a Teachers Circle (June 16–20, AIM & July 21–25, MAA, Washington, DC)

▶ How to Run a Successful Math Circle: Math Fest Mini Course (July 31–August 2)

Thank You:

▶ Kathy O'Hara

▶ Hugo Rossi

▶ Jim Sotiros

▶ Robert Bryant

▶ David Eisenbud

▶ . . . and the entire institute

An Email From Yesterday

Pick's Theorem Inbox | X

from **Sandydjdm@aol.com**   hide details 10:25 AM (11 hours ago)   ↩ Reply | ▼

to   beck@math.sfsu.edu,

cc   wiegers@math.ucdavis.edu,

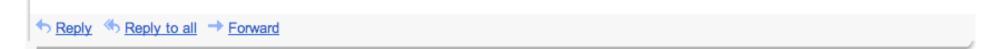date   Thu, Mar 6, 2008 at 10:25 AM

subject   Pick's Theorem

Hi, Matt,

I just wanted to let you know that I did your Pick's Theorem lesson with my MathCounts kids (6-8th grade) yesterday.... Amazingly, two of my 6th graders even came up with the relationship between the number of boundary points and the difference of the area and inside points. They had different, but equivalent "formulas".

Thanks for a great lesson! Sandy Hollenbeck (CHECC)

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