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Rare square dates pair in 2009

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Science Snapshot
Dan Vergano

By Dan Vergano, USA TODAY

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April Fools' Day this year brings a math puzzle that's no joke. The trick won't save the world like actor Nicholas Cage's numerological riddle in the currently popular apocalypse flick, *Knowing*, but at least this one makes sense.

"I like to play with numbers and dates, and I'm always looking for math puzzles," says electrical engineer **Aziz Inan** of the University of Portland (Ore.) Inan regularly cooks up **math quizzes** for a historical newsletter, the *Franklin Gazette*, devoted to statesman-scientist **Benjamin Franklin**. And that led him to ponder some dates this year.

March 3, 2009 brought us "**Square Root Day**," (3/3/9 is $3 \times 3 = 9$, get it? 3 is the square root of 9) but Inan also looked at dates another way. Only some numbers, like 9 or 16 ($4 \times 4 = 16$), have whole numbers as square roots, as you may recall from your junior-high math class. What if, Inan wondered, you wrote out all the digits in the date, and looked for such whole number square roots or "square dates"?

"I was a little surprised at what I learned," he says:

- April Fools' Day, April 1, 2009 is 04/01/2009, or 4012009, which has 2003 as a square root ($2003 \times 2003 = 4012009$.)
- March 5, 2009 is also "square date, and it is very rare to have more than one in a year ($1747 \times 1747 = 3052009$.)
- The next April Fools' square date doesn't fall until April 1, 6016 ($2004 \times 2004 = 4016016$.)

From the year 1000 until 9999, this century has the highest number of square dates, with a total of 24, Inan says. Of course, in parts of Europe, where dates are started with the day instead of the month, the "square dates" would be a little different.



Enlarge By Vince Valitutti, AP
Nicolas Cage works a math problem in a scene from "Knowing."

"A nice little tidbit for April Fools' Day," says mathematician **Arthur Benjamin** of Harvey Mudd College in Claremont, Calif., co-author of *Secrets of Mental Math: The Magician's Guide to Lightning Calculation and Amazing Math Tricks*.

Mathematicians have fooled around with similar date tricks since at least 1864, when **Augustus De Morgan** of University College London, noted the "square year," pointing out that 1849, the year of his 43rd birthday, was the square of his age at the time ($43 \times 43 = 1849$.) De Morgan was a living, breathing, math puzzle, who described himself as "being x years old in the year x^2+2 ." If you are born in 1980, you can make the same claim in 2025, when you turn 45 ($45 \times 45 = 2025$.)

Also unlike the numerology riddle in *Knowing*, Inan doesn't see any secret meanings in numerical puzzles. "If you look at numbers, you start to see all sorts of patterns and that's always intriguing," he says. His own name, he notes, is a kind of geometric word puzzle, if written in all capital letters, AZIZ INAN. Swap the vowels and turn the consonants 90 degrees and the words have switched places. "My parents didn't plan this," he says. "It's just fun."

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