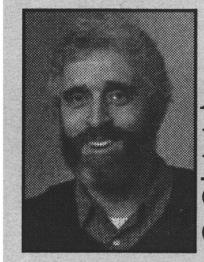
Century of squares



Aziz Inan
Guest Commentary

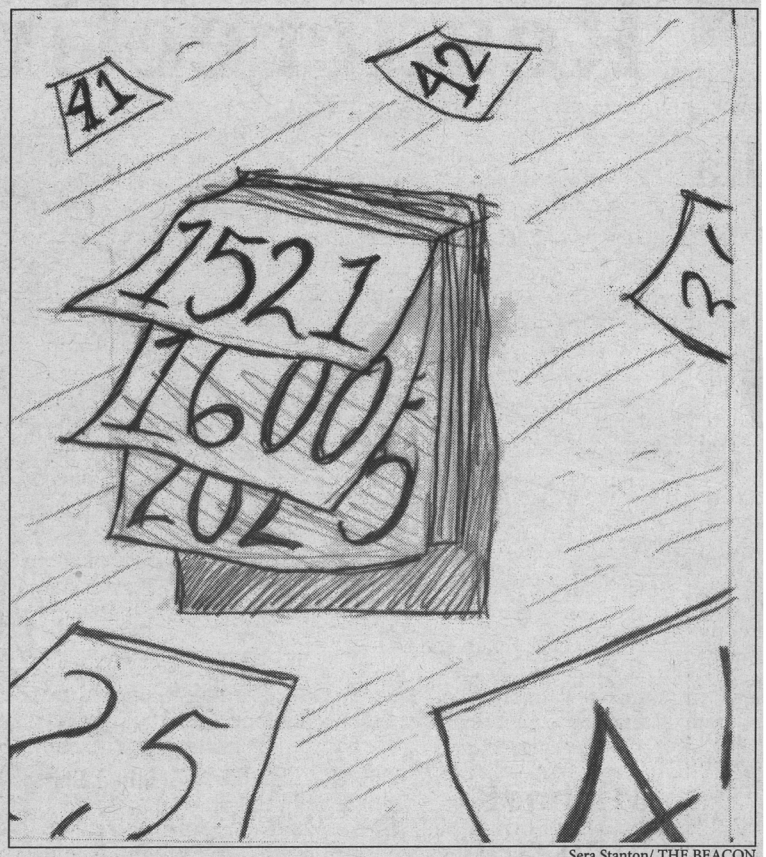
A perfect square year means the number of the year equals the square of an integer number. Some examples of perfect square years from the past are 1521, 1600, 1681, 1764, 1849 and 1936, which are squares of 39, 40, 41, 42, 43, and 44. The next perfect square year will be the year 2025 since it equals the square of 45.

Assuming a date in a four-digit year to consist of an eight-digit number represented by MMDDYYYY (where the first two digits are reserved for the month, the next two for the day, and the last four for the year of the date. For example, today's date 2/26/2009 would become 2262009), one natural question that comes to mind is, "Just like perfect square years, are there also perfect square dates?" The answer is yes, and here are some examples.

There were a total of 68 perfect square dates during the second millennium. Twelve of these perfect square dates occurred in the 16th century and seven occurred during the 17th century. The dates Dec. 6, 1729 and June 4, 1764 were the only two perfect square dates in the 18th century since 12061729 and 6041764 equal to the squares of 3473 and 2458. The dates Apr. 25, 1844 and Jan. 30, 1881 were the only two perfect square dates during the 19th century since 4251844 and 1301881 are squares of 2062 and 1141. The last four of the 68 perfect square dates in the second millennium occurred during the 20th century and these dates are July 1, 1904, June 3, 1936, Mar. 17, 1961, and May 16, 1984, since 7011904, 6031936, 3171961, and 5161984 are squares of 2648, 2456, 1781 and 2272 respectively.

There will be a total of 100 perfect square dates in the third millennium and interestingly enough, 24 of these are in the 21st century. So far, only the first one has occurred: Sept. 1, 2004, since 9012004 equals the square of 3002.

The second and third perfect square dates of this century will occur this year, one next month on Mar. 5, 2009 (since 3052009 is square of 1747) and the other the following month on April's Fool Day (since 4012009 is square of 2003). The next two perfect square dates of this century will occur on Feb. 26, 2016 and Dec. 22, 2016 (since 2262016 and 12222016 are squares of 1504 and 3496), and the next five are all in the square year 2025, on Jan. 9, Mar. 22, Apr. 18, Sept. 27, and Oct. 27, since 1092025, 3222025, 4182025, 9272025 and 10272025 are squares of 1045, 1795, 2045, 3045 and 3205 respectively. There will be three more perfect square dates in the year 2036, one in 2041, one in 2049, one in 2064, one in 2081, two in 2084, two in 2089, and two in 2096. The last perfect square day of the 21st century is on Jan. 23, 2100, since 1232100 equals the square of 1110.



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There will be a total of nine perfect square dates to come in the year 2500 and 68 more during the third millennium. Perfect square dates are indeed a fascinating application of numbers; however, in general, they are much harder to relate to because they simply involve larger square numbers than we are used to dealing with.

Aziz Inan, who is celebrating his 20th year at the University of Portland, is a professor of electrical engineering. He is also currently preparing a recreational mathematical puzzle book.