

APRIL

1 April

- 1776 Sophie Germain born in Paris. She worked in several areas of mathematics and science, including number theory. She proved Fermat's Last Theorem for exponents less than 100 (the American, Barkley Rosser, has extended this to 41,000,000). In 1816 she won the Prix Bordin for her work on vibrations of elastic plates. Naturally, she was the first woman to win this prize. See *Women of Mathematics. A Biobibliographic Sourcebook* (1987), edited by Louise S. Grinstein and Paul J. Campbell for further details.
- 1801 Gauss records in his diary that he extended his "purely analytical formula" for Easter to the Passover date. [Dunningham, p. 69]
- 1826 Combustion engine patented.
- 1862 Carl V. L. Charlier born.
- 1876 The *New-England Journal of Education* (vol. 3, p. 161), in its weekly mathematics column, published a proof of the Pythagorean theorem by General James A. Garfield, Member of Congress from Ohio, and later President of the United States. They refer to the theorem as the *pons asinorum*, though today that term is reserved for Euclid I.5 which states that the base angles of an isosceles triangle are equal.
- 1895 A. C. Aitken born. "He was asked to turn $4/47$ into a decimal. After four seconds he answered, giving one digit every three-quarters of a second: 'Point 08510638297872340425531914.' He stopped there—after 24 seconds, discussed the matter for a minute, and then started up again. 'Yes, 191489. I can get that.' Five-second pause. '361702127659574468. Now that's the repeating point. It starts again at 085. So, if that's 46 places, I'm right.'" Exercise: Check this calculation on your hand calculator. Quoted from *The Body* by Anthony Smith, NY: Walker & Co., 1968, p. 320.
- 1939 To commemorate the New York World's Fair the U.S. issued a postage stamp picturing a trylon and perisphere. This was the first stamp in the world to picture geometric objects. Can you identify these shapes? They are not in my dictionaries. [Scott #853]
- 1947 Alain Connes born in Darguignan, France. In 1982 he received a Fields Medal for his work in operator theory. See *International Mathematical Congresses: An Illustrated History, 1893–1986* by Donald J. Albers, G. L. Alexanderson, and Constance Reid for information about all of the Fields Medalists.
- 1948 Physicists Hans Bethe and George Gamow become acquainted with a bright young physicist with such an unusual name that they decided to write a joint paper, which was submitted to *The Physical Review* on this date. Its only unusual feature was its by-line, "by Alpher, Bethe, and Gamow." [Eves, *Revisited*, 268°]
- 1967 The Uniform Time Act of 1966 (80 Stat. L. 107, April 13, 1966), effective 1 April 1967, divided the U.S. into eight time zones: eastern, central, mountain, Pacific, Yukon, Alaska, Hawaii and Bering. (Kane, p. 667) See 18 November 1883.
- 1975 Martin Gardner announced that in November 1974, William McGregor, a graph theorist of Wappingers Falls, N.Y., discovered a counterexample to the four-color conjecture. He produced a map containing 110 regions that requires five colors. This "Mathematical Games" column provoked over one thousand letters including a threatened lawsuit from Ivan Guffvanoff III at the University of Wisconsin who destroyed his disproof after reading of this counterexample in *The New York Times*. The mathematics students at the University of Warwick realized that the column was an April Fool's joke, for they published this poem in *Manifold*, a journal of mathematical humor:

"Oh Mr. Gardner,
 What have you done?
 You've started up a rumour
 You should never have begun!
 A four-colour hoax can't

Be undone so quick . . .
 Oh Mr. Gardner, what
 A bloody silly trick!"

For more details see *Time Travel and Other Mathematical Bewilderments* by Martin Gardner, 1988, pp. 134–135.

- 2001 Lord K. Elvin, of the Institute for Haughty Attitudes, will submit a paper entitled "What every young mathematician should know," to the *Bulletin of the Advanced Mathematical Society* that calls attention to the result

$$\int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi}.$$

The paper ends with a quote from the author's "namesake": "A mathematician is one to whom *that* is as obvious as that twice two makes four is to you." For a preprint see M. D. Spivak, Ph.D., *The Joy of T_EX* (1986), p. 666. The number of the beast is also p. [iv].

2 April

- 999 Gerbert was elected Pope Sylvester II. He introduced into the West the practice of making calculations by using marked discs (apices). This method, which has nearly all the advantages of positional arithmetic, was used in abacus calculations throughout the eleventh and twelfth centuries. [Dedron, p. 168]
- 1792 U.S. Mint established. It was Jefferson who suggested decimal coinage.
- 1845 Fizeau and Foucault take the first successful photograph of the sun.
- 1933 Emmy Noether's right to teach at Göttingen was withdrawn because of her Jewish ancestry. The resulting infusion of scientists played a major role in transferring mathematical leadership from Germany to the United States. See *AMM*, 90(1983), 717.
- 1934 Birthdate of Paul Cohen. In 1963 he proved, using his technique of forcing, that the axiom of choice and the continuum hypothesis are independent of the other axioms of set theory. For this work he received the Fields Medal in 1966.
- 1943 "Electronic Differential Analyzer" report submitted.
- 1948 Kurt Gödel became a United States citizen. Being the diligent individual that he was, he studied the constitution carefully beforehand and felt that he had found a contradiction. On the way to the ceremony Einstein and von Neumann tried to keep his mind on other issues, but when the judge called them into his chambers (so that he could meet Einstein) he asked Gödel if he had anything to say. It was only with considerable effort that his friends were able to change the subject when Gödel brought up the contradiction.
- 1984 First day of the baseball season. The exact width of home plate is irrational: 12 times the square root of two. History: The plate was originally a circle of diameter one, then a square of the same size(!), which, by mistake was a one-by-one square. Then the corners were filled in to make the current pentagonal plate. [Need to find a uniform way of updating this.]

3 April

- 1717 Death of Jacques Ozanam, noted for his book on mathematical recreations. "He was wont to say that it was the business of the Sorbonne doctors to discuss, of the pope to decide, and of a mathematician to go straight to heaven in a perpendicular line." [DSB 10, 264].
- 1817 Friedrich Ludwig Wachter (1792–1817), a student of Gauss, called the geometry obtained by denying Euclid's parallel postulate "anti-Euclidean geometry". Had he returned from his customary evening walk on this date he might now be known as one of the founders of non-Euclidean geometry. [G. E. Martin, *Foundations of Geometry and the Non-Euclidean Plane*, p. 306]
- 1827 Ernst Florenz Friedrich Chladni, physicist and amateur musician, died. He is best remembered for the spectacular symmetrical patterns formed when a sand covered plate is vibrated with a violin bow. See DSB 3, 258.

- 1909 Birthdate of Stanislaw Ulam.
- 1964 It is reported in the *New York Times* that the casinos in Las Vegas have changed their rules in blackjack so as to defeat the winning strategy devised by Edward O. Thorp. See 27 March 1964.
- 1983 The Republic of China (Taiwan) marks the 400th anniversary of the arrival of Father Matteo Ricci (1552–1610) in China with a pair of stamps. [Scott #2359–2360]

4 April

- 1617 John Napier, inventor of logarithms, died, most likely of gout. [P. Hume Brown in the *Napier Tercentenary Volume*, p. 48; Thanks to Kullman]
- 1692 *Acta eruditorum* contained, under a pseudonym, Vincenzo Viviani's problem of constructing in a hemispherical cupola four equal-sized windows such that the remaining area of the cupola is quadrable. The problem was solved by Leibniz (date?), Guido Grandi (1699), and Viviani himself (1692). [DSB 5, 499]
- 1809 Benjamin Peirce born in Salem, MA. He taught at Harvard for 49 years. Early on, he and the other young mathematics tutor, Charles W. Eliot, secured the innovation of written final examinations. Previously all exams were oral. Eliot later became president of Harvard. [Midonick, *The Treasury of Mathematics*, p. 610]
- 1870 Benjamin Peirce wrote in the introduction of his "Linear Associative Algebra," doubtless his most original mathematical work: "This work has been the pleasantest mathematical effort of my life. In no other have I seemed to myself to have received so full a reward for my mental labor in the novelty and breadth of the results." [MAA 32(1925); p. 15 of Benjamin Peirce, MAA offprint of 1925]
- 1949 Shing-Tung Yau born in Kwuntung, China. In 1982 he received a Fields Medal for his work in differential equations and algebraic geometry.
- 1983 "Number theory, an abstruse specialty concerned with the properties of whole numbers." Quoted from *Time* by André Weil in his *Number Theory, An Approach through History*.

5 April

- 1607 Honoré Fabri, or Honoratus Fabrius, born in France. He developed the infinitesimal methods of Cavalieri and Torricelli and his quadrature of the cycloid inspired Leibniz. Some of his geometrical work boils down to special cases of $\int x^n \sin x \, dx$, $\int \sin^n x \, dx$ and $\int \int \arcsin x \, dx \, dy$. [DSB 4, 506]
- 1684 William Brouncker died in London. He was the King's nominee and first president of the Royal Society of London (1666–1677). In 1656 he gave the continued fraction expansion:

$$\frac{\pi}{4} = 1 + \frac{1^2}{2 + \frac{3^2}{2 + \frac{5^2}{2 + \ddots}}}$$

and used it to calculate π correct to ten decimal places. [DSB 2, 507]

- 1752 Taxes are due in England. Previously they were due on March 25, the first day of the year, but because the adoption of the Gregorian calendar reform necessitated the dropping of eleven days, the tax date was changed also. Apparently the tax collectors couldn't do fractions.
- 1792 George Washington cast the first presidential veto. Amazingly, mathematics was involved. It was the first bill for apportionment of the House, which used the method of Alexander Hamilton: First determine the number of seats (they used 120) and then use the population of the individual states to determine the *quota* of seats that each state should get. These quotas will be decimals. Now give to each state the number of representatives signified by the whole

number part of the quota. Then distribute the remaining seats to the states with the largest decimal part. Washington “negated” the bill because the representatives did not represent the same number of people in each state, as the constitution required. For full details see Michael L. Balinski and H. Peyton Young, *Fair Representation. Meeting the Ideal of One Man, One Vote*, (1982), p. 19.

6 April

- 648 B.C. First Greek record of a total solar eclipse is made. See June 4, 780 B.C., and October 13, 2128 B.C.
- 1829 Niels Henrik Abel, age 26, died of tuberculosis. In 1929 Norway issued four stamps for the centenary of his death. [Scott #145–148]
- 1909 Ernst Zermelo (1871–1953) liked to argue that it is impossible for anyone ever to reach the North Pole, because the amount of whiskey needed to reach any latitude is proportional to the tangent of that latitude. Unaware of this argument, Robert E. Peary wrote in his diary on this date. “The Pole at last!!! The prize of 3 centuries, my dream & ambition for 23 years. Mine at last. I cannot bring myself to realize it. It all seems so simple . . .” Peary, his remarkable Black associate, Matthew Henson, and four Eskimos were the first humans to reach the North Pole. See *The National Geographic Society. 100 Years of Adventure and Discovery* (1987), pp. 53 & 59. [Reid, *Hilbert*, p. 97.]
- 1922 Emmy Noether named “unofficial associate professor” at Göttingen. This purely honorary position reveals the strong prejudice of the day against women. [DSB 10, 138 and A. Dick, p. xiii.]
- 1938 DuPont researcher Roy Plunkett and his assistant, Jack Rebok, discovered polytetrafluoroethylene, the slipperiest man-made substance. Teflon became a household word in 1960 when Teflon-coated frying pans were introduced. The Manhattan Project used it in producing Uranium-235, for it was the only gasket material that would contain the corrosive hexafluoride.
- 1956 The first circular office building, the Capital Tower, at Hollywood and Vine in Los Angeles, was dedicated. The building has a diameter of 92 feet and a height of 150 feet. Above the 13 floors was a 90 foot spire from which a beacon flashed the word “Hollywood” in Morse code. [Kane, p. 140]
- 1967 Spain issued a stamp picturing Averroës (1126–1198) [Check dates. 1120?], physician and philosopher. [Scott #1461]
- 1972 Cray Research founded.

7 April

- 1866 Birthdate of Erik Ivar Fredholm.
- 1923 Peter Hilton born. This noted topologist has considerable interest in mathematics education. For an interview with him see *Mathematical People* edited by Donald J. Albers and G. L. Alexanderson.
- 1933 Raymond Edward Alan Christopher Paley, 26, was killed in an avalanche while skiing near Banff, Alberta, Canada. G. H. Hardy wrote of this young analyst: “There is something very intimidating to an older man in such youthful quickness and power, and of all the people who frightened me when I came back to Cambridge, Paley was the man who frightened me the most.” [*Collected Papers of G. H. Hardy*, vol. 7, p. 745.]
- 1953 IBM 701 formally dedicated at a luncheon at which Oppenheimer was the principal speaker. It used electrostatic storage tubes, a magnetic drum, and magnetic tapes. In all, 19 of these machines were built, and IBM was launched into the new world of electronic computers. [Goldstein, *The Computer from Pascal to von Neumann*, p. 328]
- 1970 The Netherlands issued a set of five stamps designed with the aid of a computer. See *Journal of Recreational Mathematics*, 4(1971), 20–23, for pictures and discussion.

- 1978 An editorial in the *Pensacola Journal* on minimum competency in English and mathematics stated, "After all, if you give the test to four students and four flunk, that's a 50 percent failure rate." [*The AMATYC Journal*, 13(1979), 59]
- 1981 The fastest computation of the 13th root of a 100-digit number is in 1 minute and 28.8 seconds by Willem Klein. [Guinness]
- 1989 To start his after-dinner remarks at a meeting of the Ohio Section of the MAA, Gerald Alexanderson told the following story that he had heard from Pólya, who heard it from Lebesgue: At the coliseum in Rome the emperor ordered a lion to be brought into the arena with a christian. The christian whispered something in the lion's ear and the lion became meek and whimpered away. This scene was repeated with increasingly ferocious lions. Finally the emperor told the christian that he could go free if he would tell him what he was saying to the lion. The response was truly frightening: "After dinner you have to give a speech."

8 April

- 1796 Gauss completes his first proof (of six) of quadratic reciprocity. [Buhler, *Gauss*, 32]
- 1799 The date of the still uninterpreted cryptic entry

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in Gauss's scientific diary. [Thanks to Howard Eves]

- 1829 A letter arrives at Abel's home informing him of his appointment to a professorship at the University of Berlin. Unfortunately he had died two days previously. [Gallian, *Contemporary Abstract Algebra*, p. 25]
- 1903 Aurel Wintner born. In 1929 he published the first proofs of the basic facts in Hilbert space—the fundamental mathematical construct in the then-developing physical theory of quantum mechanics. [DSB 14, 454]
- 1943 The Rockefeller Foundation review announced that the "differential analyzer" at MIT was built at a cost of \$130,500.

9 April

- 1626 English philosopher, Francis Bacon, died a month after performing his first scientific experiment. He stuffed a chicken with snow to see if this would cause it to spoil less rapidly. The chill he caught during this experiment led to his death. [A. Hellemans and B. Bunch. *The Timetables of Science*, p. 32].
- 1673 Leibniz elected Fellow of the Royal Society of London, a position of which he was very desirous. [*The Correspondence of Henry Oldenburg*, 9, p. 583].
- 1810 Laplace announced his central limit theorem.
- 1833 Peterborough, New Hampshire established the first free public library (supported by taxation) in the U.S.
- 1865 Charles P. Steinmetz born. In 1888 he was about to receive his Ph.D. in mathematics from the University of Breslau but fled the country to avoid arrest as a socialist. This hunchback with a high squeaky voice published several papers in mathematics, but earned his living as an electrical engineer. [*A Century of American Mathematics*, Part 1, p. 14].
- 1869 Birthdate of Elie Cartan, who worked on analysis on differential manifolds. [DSB 3, 95]
- 1878 Marcel Grossmann born. He was a classmate of Albert Einstein. When Einstein sought to formulate his ideas on general relativity mathematically, he turned to Grossmann for assistance. [DSB 5, 554]
- 1919 J. Presper Eckert born.
- 1931 Heisuke Hironaka born in Yamaguchi-Ken, Japan. In 1970 he won a Fields Medal for generalizing work of Zariski on the resolution of singularities of algebraic varieties.

10 April

- 1651 Ehrenfried Walther Tschirnhaus born. Together with Leibniz he studied the unpublished papers of Descartes, Pascal and Roberval. His algebra, which Newton hoped to publish in an annotated translation, contains one of the earliest statements of the quadratic formula in a form identical to what we use today. See DSB 13, 479.
- 1755 Simpson introduced error distributions.
- 1790 First patent law enacted in the U.S.
- 1793 Gaspard Monge was permitted to resign from the Ministry of the Navy and the Colonies of France in order to undertake the urgent task of supplying the French army with gunpowder. [Thanks to Howard Eves]
- 1813 Joseph Louis Lagrange died, in his 76th year. [Thanks to Howard Eves]
- 1857 Birthdate of Henry Ernest Dudeney (pronounced with a long “u” and a strong accent on the first syllable, as in “scrutiny”). He was England’s greatest maker of puzzles of mathematical interest, publishing six books of puzzles. His first work appears under the pseudonym “sphinx.” Although he never met Sam Loyd, they were in frequent correspondence and informally exchanged ideas. For samples of his puzzles see *536 Puzzles & Curious Problems*, by Henry Ernest Dudeney (Edited, 1967, by Martin Gardner)[p. vii].
- 1882 The U.S. issued its first postage stamp honoring President James A. Garfield (1831–1881). His only claim to mathematical fame was a new proof of the Pythagorean Theorem. [Scott #205]
- 1883 Richard von Mises, probabilist, born.
- 1911 Death of Sam Loyd, Americas greatest puzzlist. His son edited several collections of the father’s puzzles, including the mammoth *Cyclopedia of Puzzles*, which he privately printed in 1914. It remains today the largest, most interesting collection of puzzles ever printed. For a selection see *Mathematical Puzzles of Sam Loyd*, edited by Martin Gardner, Dover 1959 [p. xiv].
- 1914 Moritz Cantor, historian of mathematics, died.
- 1971 Lebanon issued a stamp honoring Hassan Kamel al-Sabbah (1894–1935). [Scott #C622]

11 April

- 1914 Dorothy Bernstein born in Chicago. After earning her Ph.D. under J. D. Tamarkin at Brown in 1939 she taught at Mount Holyoke, Wisconsin, Berkeley, Rochester, and Goucher. She works in applied mathematics. See Grinstein and Campbell, *Women of Mathematics* for further details.
- 1936 Zuse patent filed for automatic execution of calculations.
- 1970 France issued a stamp honoring the physicist Maurice de Broglie (1875–1960). He is pictured with a spectrograph. [Scott #B439]
- 1974 Abraham Robinson, creator of non-standard analysis, died.

12 April

- 1734 Thomas Fantel de Lagny, who computed π to 112 decimal places using Gregory’s series, died. Maupertius was called to de Lagny’s deathbed, and finding the poor man unconscious, asked him for the square of 12. Like an automaton, de Lagny rose in bed, gave the answer, and immediately passed away. [Eves, *Circles*, 238° and Allen Debus, *World Who’s Who in Science*]
- 1743 George Cheyne died. His 1703 error-filled work on the calculus (David Gregory counted 429 errors) so provoked Newton that he published his own work on quadratures in the 1704 edition of his *Optics*. [DSB 3, 244]
- 1794 Germinal Pierre Dandelin born. He is known for his ingenious use of spheres in a cone to show that the definitions of the conics as sections of a cone are equivalent to the loci definitions. [DSB 3, 554]
- 1842 The first mutual life insurance company in the U.S. was chartered. Since such companies must employ many actuaries, this provides a good source of jobs for individuals with a knowledge

of mathematics.

- 1852 Carl Louis Ferdinand von Lindemann born. He showed π transcendental; consequently the circle cannot be squared.
- 1898 Marie Curie presented, to the Académie des Sciences, a preliminary note that marked the first step in the discovery of radium and opened to mankind the immense world of nuclear physics. [DSB 3, 507]
- 1961 In Syracuse, Italy, the scientific festivities began to celebrate the memory of Archimedes who was born in the city in 287 BC and was killed there in 212 BC by a Roman soldier. His last words, according to Livy, were “Nolitangere circulos meos” (Don't touch my circles). [*Scripta Mathematica*, 26(1961), 143]
- 1961 Yuri Gagarin became the first man in space, orbiting the earth in 108 minutes in the Soviet spacecraft *Vostok*.
- 1977 Fiji issued a stamp showing a world map in sinusoidal projection. [Scott #374] [State its advantages]
- 1981 First flight of the Space Shuttle *Columbia*, the world's first reusable manned space vehicle, by astronauts John W. Young and Robert L. Crippen. The HP 41 calculator was used on this flight. In fact, the hand-held calculator is one byproduct of the space program.

13 April

- 1743 Thomas Jefferson born.
- 1791 Legendre is named one of the French Academy's three commissioners for the astronomical operations and triangulations necessary for determining the standard meter. The others were Mechain and Cassini IV. [DSB 8, 136]
- 1869 Ada Isabel Maddison born in Cumberland, England. She attended Girton College, Cambridge, in the same class with Grace Chisholm Young and they attended lectures of Cayley. Then she came to Bryn Mawr, where she earned her Ph.D. in 1895. She continued there until retirement, involved mostly in administrative work. See Grinstein and Campbell, *Women of Mathematics*.

14 April

- 1611 The term “telescope” was introduced by Prince Federico Cesi at a banquet given in Galileo's honor. It derives from the Greek “tele” meaning “far away” and “skopéo” meaning “to look intently.” For a change, a term which derives from the Greek was actually coined by a Greek, namely Ioannes Demisiani. [Willy Ley, *Watchers of the Skies*, p. 112]
- 1628 Webster copyrighted the first dictionary.
- 1629 Christiaan Huygens born.
- 1790 Mathurin Jacques Brisson (1723–1806) proposed to the Paris Academy the establishment of a system of measurement resting on a natural unit of length. The general idea of decimal subdivision was obtained from a work of Thomas Williams, London, 1788. [Cajori, *History of Mathematics*, p. 265] See 19 March 1791 and DSB 9, 554.
- 1855 The first chess problem of Sam Loyd, age fourteen, was published in the *New York Saturday Courier*. Within a few years he was recognized as the nation's foremost composer of chess problems. Once he announced that he had discovered a way to mate a lone king in the center of the board with a knight and two rooks. Readers were first furious, afterwards amused, by his preposterous solution: line them up in the order knight, rook, king, rook. [*Mathematical Puzzles of Sam Loyd*, edited by Martin Gardner, Dover 1959, p. xi-xii]
- 1931 The first issue of the review journal *Zentralblatt für Mathematik* was published by Springer. The MAA's Award for Distinguished Service was given to Otto Neugebauer for his role in founding it and its American counterpart, *Mathematical Reviews*. See AMM 86 (1979), 77–78.
- 1935 Emmy Noether died.

15 April

- 1446 Filippo Brunelleschi, architect, died. Verify date. Is it the 16th?
- 1452 Leonardo daVinci born.
- 1548 Pietro Antonio Cataldi born. In 1613 he published an important early work on continued fractions. The term “continued fraction” was coined by John Wallis in 1655. [DSB 3, 125]
- 1707 Leonhard Euler born in Basel, Switzerland. He was the most productive mathematician of all times; his still only partly published collected works comprise over 75 large volumes.
- 1946 France issued a stamp picturing Charlemagne (742–814). [Scott #B427]
- 1952 The first bank credit card was issued by Franklin National Bank, Franklin Square, New York. Purchases were charged to the bank, which made the payments, and then billed the card holders. [Kane, p. 207]
- 1968 Data General Corporation founded. The 1981 Pulitzer prize winner *The Soul of a New Machine* describes the development of their ECLIPSE computer.

16 April

- 1446 Death of the architect Filippo Brunelleschi, who helped develop a systematic mathematical perspective.
- 1673 “I conjecture that Mr. Collins himself does not speak of these summations of infinite series because he brings forward the example of the series $1/2, 1/3, 1/4, 1/5, 1/6, \dots$ which if it is continued to infinity cannot be summed because the sum is not finite, like the sum of the triangular numbers, but infinite. But now I am cramped by the space of my paper.” Leibniz to Oldenburg, indicating some hint of a distinction between convergent and divergent series. [*The Correspondence of Henry Oldenburg*, 9, pp. 599–600.]
- 1674 Sluse elected a member of the Royal Society of London. [*The Correspondence of Henry Oldenburg*, 10, p. 483]
- 1682 John Hadley born. He invented the navigational sextant in 1731.
- 1705 Newton knighted by Queen Anne at Trinity College. [DSB 10, 83]
- 1766 Sir John Leslie born.
- 1823 Ferdinand Gotthold Max Eisenstein born in Berlin, Germany.
- 1873 Alfred Young born.
- 1894 Jerzy Neyman, statistician, born. He died in 1981.
- 1938 The first William Lowell Putnam competition was held. It was won by the team of three from the University of Toronto. Irving Kaplansky was one of the team members. For the history of this now famous exam for undergraduates, see *AMM*, 72(1965), p. 474.

17 April

- 1761 Deathdate of Thomas Bayes who did important early work on statistical inference. [DSB 1, 531]
- 1798 Birthdate of the geometer Etienne Bobillier. [DSB 2, 213]
- 1853 Arthur Moritz Schoenflies born. He discovered, independently of E. S. Fedorov, the 230 crystallographic groups and did early work in set theory and topology. [DSB 12, 195]
- 1935 Turkey issued a series of semi-postal stamps commemorating the 12th congress of the Women’s International Alliance. One pictured a school teacher. Another was the first stamp honoring Marie Skłodowska Curie. [Scott #B55, B67]

18 April

- 1557 Maurolico completed the first volume of his *Arithmetic* at three o’clock in the morning on Easter Sunday. [Jean Cassinet, *Mathematics from Manuscript to Print, 1300–1600*, p. 162; Thanks to

Dave Kullman]

- 1775 Paul Revere's Ride. The revolutionary War began the next day. Now you probably think this has nothing to do with mathematics, but how do you suppose he got that lantern up in the church steeple? Easy, he used a key to get in. Since he was a change ringer, a highly mathematical activity, he needed a key to get up to the bells.
- 1796 Professor E. A. W. Zimmerman sends a short notice of Gauss's work on constructibility of regular polygons (see March 30, 1796) to the *Jenenser Intelligenzblatt*. He adds, "It is worthy of notice that Herr Gauss is now in his 18th year and has devoted himself here in Brunswick to philosophy and classical literature with just as great success as to higher mathematics." [Tietze, 204]
- 1831 Founding of the University of the City of New York. [Muller]
- 1906 San Francisco earthquake and resulting fires destroy the city. [*American Heritage Magazine*, Feb/March, 1983]
- 1907 Lars Valerian Ahlfors born in Helsinki. In 1936 he received a Fields Medal for his work on Riemann Surfaces.
- 1949 Charles Louis Fefferman born in Washington, D.C. In 1978 he received a Fields Medal for his work on complex analysis.
- 1955 Albert Einstein died.
- 1958 India issued a stamp commemorating the centenary of the birth of Dr. Dhondo Keshav Karve (1858-1922), pioneer of women's education. [Scott #299]

19 April

- 1486 Michael Stifel born. This number mystic (for his "beasting" of Pope Leo X, see Eves, *History*, p. 199) became the greatest German algebraist of the sixteenth century. He died on the same date in 1567. [Muller]
- 1739 Nicholas Saunderson died of scurvy at age 56. At age 1 he became blind from smallpox. This did not prevent him from learning Greek, Latin and French and "hearing" the works of Euclid, Archimedes, and Diophantus in the original, learning some parts by heart. He created a "palpable arithmetic," a nailboard for doing arithmetic and forming diagrams with silk threads—the forerunner of the geoboard. He became Lucasian professor at Cambridge in 1711 and earned a reputation as an excellent teacher.
- 1801 Gustav Theodor Fechner born.
- 1839 Dorothea Gauss, mother of Carl Friedrich Gauss, died (following four years of total blindness) in her famous son's home. [Thanks to Howard Eves]
- 1879 "A red letter day in Massachusetts. On that day the second circular which launched the Harvard 'Annex', later Radcliffe College, was sent out ..." Mathematics 2 dealt with plane geometry and algebra through quadratics. [*Scripta Mathematica*, 11(1945), p. 260]
- 1933 Deathdate of Ernest William Hobson, the British analyst who fought against "the superstition that it is impossible to be 'rigorous' without being dull." "Although he lived to be seventy-six he was active almost up to his death; his last book (and perhaps in some ways his best) was published when he was seventy-four. He was a singular exception to the general rule that good mathematicians do their best work when they are young." See *The Mathematical Intelligencer*, 6(1984), no. 2, p. 9.
- 1957 First FORTRAN program run.
- 1958 France issued a stamp to honor Jean Cavailès (1903-1944) as a hero of the French Underground during World War II. [Scott #879]
- 1975 India's first scientific satellite was successfully launched from a Soviet cosmodrome with the help of the Soviet rocket carrier at 1300 hours Indian standard time. The satellite was named Āryabhaṭa, after the famous Indian astronomer and mathematician, who was born in Kusuma-

pura, near present-day Patna, in A.D. 476. [Eves, *Return to Mathematical Circles*, 7°]

- 1977 The German Democratic Republic issued a stamp commemorating the 200th anniversary of Gauss's birth, 30 April 1777. Besides a portrait of Gauss there is a geometric construction (dealing with the constructible regular polygons?). Why wasn't it issued on the anniversary day? [Scott #1811]
- 1988 In an article entitled "Hot hands phenomenon: A myth?" the *New York Times* (pp. 23, 25) reported on work of the Stanford Psychologist A. Iversky. Most fans believe that a player who has made a string of baskets is likely to succeed on the next try. By examining thousands of shots of the Philadelphia 76ers over a season and a half, Iversky has shown otherwise: Outcomes of successive shots are independent. [*Mathematics Magazine* 61 (1988), p. 268].

20 April

- 1833 The great German geometer Jakob Steiner received an honorary degree from the University of Königsberg. [DSB 13, 14]
- 1902 Pierre and Marie Curie extract radium from naturally occurring ores.
- 1932 Giuseppe Peano, 73, died, after teaching his regular classes the previous day. He axiomatized the natural numbers (1889), elementary geometry (1889), and many other systems. One could say that axiomatization was Peano's forte! See DSB 10, 441–444.
- 1975 India issued a stamp to celebrate the launching of the Āryabhata satellite the previous day. This has to be a record for a quick celebration with a stamp. [Scott #655]

21 April

- 1547 In a dispute over the priority for solving cubics, Tartaglia sent Ferrari 31 challenge problems. They were no harder than those in Luca Pacioli's *Summa* (1494). See 24 May 1547.
- 1652 Birthdate of Michel Rolle, whose favorite area of research was the theory of equations. He introduced the symbol we use for n^{th} roots. See DSB 11, 512.
- 1692 David Gregory delivered his inaugural lecture as Savilian professor of astronomy at Oxford. He received his post on the recommendation of Newton. See DSB 5, 522.
- 1791 Benjamin Bannaker, the outstanding Black self-taught mathematical-astronomer, completed the outline of the boundaries of the federal district, Washington D. C.
- 1910 Halley's comet passed perihelion.
- 1951 Michael H. Freedman born in Los Angeles. In 1986 he received a Fields Medal for his proof of the four-dimensional Poincaré conjecture.

22 April

- 1592 Wilhelm Shickard born. He invented and built a working model of the first modern mechanical calculator. [DSB 12, 162]
- ???? In the century and a half between 1725 and 1875, the French fought and won a certain battle on 22 April of one year, and 4382 days later, also on 22 April, they gained another victory. The sum of the digits of the years is 40. Find the years of the battles. For a solution see Ball's *Mathematical Recreations and Essays*, 11th edition, p. 27.
- 1724 Immanuel Kant born in Königsberg, Germany. He did work on the philosophy of mathematics.
- 17816 The French general, Charles Denis Sauter Bourbaki was born. There is a statue of him in Nancy, France, where Jean Dieudonné once taught. The polycephalic mathematician Nicolas Bourbaki was named after him. See Joong Fang, *Bourbaki*, Paideia Press, 1970, p. 24.
- 1925 Felix Klein died. In 1905 he recommended the teaching of calculus in the German secondary schools. [DSB 7, 399]
- 1929 Michael Francis Atiyah born in London. In 1966 he received a Fields Medal for his work on K -theory, the index theorem for elliptic operators, and a fixed point theorem in topology.

23 April

- 1484 Birthdate of Julius Scaliger, critic of the Gregorian calendar reform.
- 1616 Miguel de Cervantes Saavedra and William Shakespeare both died on this date, the former in Madrid, Spain, the latter in Stratford-on-Avon, England. Which one died first? This is not a trick question; they died several days apart. All you need to solve it is some knowledge of the calendar. (Curiously, Shakespeare was born on this date in 1564.)
- 1827 Sir William Hamilton presented an abstract of "Theory of systems of rays" to the Royal Irish Society. [Bell, *Men of Mathematics*, 346]
- 1844 Jozef Körösy born.
- 1858 Max Plank, German physicist, born.
- 1910 Shiela Scott Macintyre born in Edinburgh. She was the author of a dozen papers on analysis. For more information about her see *Women of Mathematics* by Grinstein and Campbell, p. 140.
- 1948 Contract signed by A. Nielsen for UNIVAC I.
- 1982 "It is sometimes said that the idea of the derivative was motivated chiefly by physics However plausible these suggestions may sound, and however important physics was in the later development of the calculus, physical questions were in fact neither the immediate motivation nor the first application of the calculus." Judith V. Grabiner in a talk at Ball State as published in *Mathematics Magazine*, 56(1983), p. 198.
- 1985 The Boston Latin School celebrated its 350th birthday. It is one year older than Harvard. See *New York Times Magazine*, 21 April 1985.

24 April

- 1620 John Graunt born. His only book, *Natural and Political Observations . . . upon the Bills of Mortality* (1662), was the foundations of both statistics and demography. See DSB 5, 507.
- 1800 The Library of Congress established [2 Stat. L. 56]. \$5000 was appropriated "for the purchase of such books as may be necessary for the use of Congress at the said city of Washington and for filling up a suitable apartment for containing them and for placing them therein." The first catalog, dated April 1802, listed 964 volumes and 9 maps. [Kane, p. 350]
- 1897 The Chicago Section of the American Mathematical Society held its organizational meeting in Chicago under the chairmanship of E. H. Moore. It was the first section of the AMS. [Cajori, *Historical Introduction to the Mathematical Literature*, p. 34]
- 1930 Death of Henry Ernest Dudeney, England's greatest puzzlist. He was unusually skilled at geometrical dissections—cutting a polygon into the smallest number of pieces that can be refitted to make a different type of polygon. He was also the first to apply digital roots, a term he coined, to recreational mathematics. For samples of his puzzles see *536 Puzzles & Curious Problems*, by Henry Ernest Dudeney (Edited, 1967, by Martin Gardner)[p. viii-ix].
- 1949 Columbia issued a stamp honoring the mathematician Julio Garavito Armero (1865–1920). [Scott #573]
- 1980 The winning number in the Pennsylvania lottery was 666. On this day a group of men bet some \$20,000 on all combinations involving just 4 and 6. The state lost two million. In 1982 two men were convicted of a lottery fix. Ironically, on the day they went to prison, Delaware's daily number came up 555.
- 1984 The Morgan Hill Earthquake with an acceleration of 1.3 G's is the "fastest" on record. It shook up a meeting of the International Study Group for History and Pedagogy of Mathematics in San Francisco (25 miles North). [Thanks to Smoryński]

25 April

- 1611 Galileo became a member of the Accademia dei Lincei. [DSB 11, 96]
- 1832 In a debate over the apportionment of the House, Senator Dickerson of New Jersey invoked the

language of Berkeley's *Analyst* when he railed against using Jefferson's apportionment method wherein fractions are ignored: "These quasi-representitives, these infinitesimal, evanescent Representatives, these ideal Representatives, these ghosts of Representatives, after being counted in order to give the favored States their full proportion of a House of 250, are dismissed the service." [P. 34 of the reference cited at 5 April 1792]

- 1849 Christian Felix Klein born in Düsseldorf, Germany († 1922). In 1871 he constructed projective models for the three types of non-Euclidean geometries—the so-called Klein models. This work popularized non-Euclidean geometries among mathematicians. [DSB 7, 397]
- 1879 Edwin Bidwell Wilson born. As a student of Willard Gibbs at Yale he codified the physicist's lectures on vector analysis into a textbook (1901) that profoundly influenced the use and notation of the subject. In 1912 he published a comprehensive text on advanced calculus that was the first really modern book of its kind in the U.S. [DSB 14, 437]
- 1900 Wolfgang Pauli, physicist, born.
- 1961 Noyce patent issued for the semiconductor.
- 2038 The next time that Easter will occur on April 25, the latest possible date. The last time Easter was on April 25 was in 1943.

26 April

- 1600 Death of Cunradus Dasypodius whose fame is based on the "construction of an ingenious and accurate astronomical clock in the cathedral of Strasbourg, installed between 1571 and 1574." [DSB 3, 585]
- 1711 David Hume, philosopher, born in Edinburgh, Scotland.
- 1874 Edward Vermilye Huntington born († 1952). This enthusiastic and innovative teacher was professor of mechanics at Harvard from 1919 to 1941. He made many contributions to the logical foundations of mathematics. His book, *The Continuum* (1917), was the standard introduction to set theory for many years. In 1928 he recommended the "method of equal proportion" for the apportionment of representatives to Congress; in 1941 this method was adopted by Congress. [DSB 9, 571]
- 1889 Ludwig Wittgenstein born. This noted philosopher introduced the word "tautology" in his *Tractatus Logico Philosophicus* of 1921. [DSB 14, 468]
- 1892 Hermite to Stieltjes: "You state this result and then try to mortify me by saying that it is easy to prove. Since I can't succeed in doing it I appeal to your good nature to help me out of this difficulty." [*Two Year Journal*, 11, 49]
- 1900 Charles Richter born. This American seismologist developed the earthquake magnitude scale which bears his name.
- 1920 Shapley and Curtis debate the nature of the nebulae.
- 1920 Srinivasa Aaiyengar Ramanujan died at age 32. This self educated mathematician, who was discovered by G. H. Hardy of Cambridge, is remembered for his notebooks crammed with complicated identities. [DSB 11, 267]
- 1968 *Time* magazine (p. 41) reports a "Trial by Mathematics" in which a couple was convicted on the basis of mathematical probability. Later the reasoning was found to be incorrect. The discussion there is of interest. See also *Journal of Recreational Mathematics*, 1(1968), p. 183.
- 1985 A 22-cent commemorative stamp for Public Education in America issued in Boston.
- 1986 Nuclear reactor number 4 at Chernobyl, USSR, exploded and released a large amount of radioactive material into the atmosphere. [A. Hellemans and B. Bunch. *The Timetables of Science*, p. 597].

27 April

- 1657 Christiaan Huygens published *De ratiociniis in ludo aleae*.

- 1740 The French Académie des Sciences announced that their prize on the ebb and flow of the tides would be shared between Leonhard Euler, Daniel Bernoulli, Antoine Cavalleri, one of the last of the Cartesians, and Colin Maclaurin, then Professor of Mathematics at the University of Edinburgh. [Niccoló Guiciardini, *The Development of Newtonian Calculus in Britain 1700-1800* (1989), p. 69.]
- 1783 In a letter to A. M. Lorgna, Gian Francesco Malfatti gave the polar equation concerning the squaring of the circle. [DSB 9, 55] Does this refer to the polar equation of the spiral of Archimedes, $r = a\theta$? [Thanks to Howard Eves]
- 1837 Paul Albert Gordan, king of the invariant theorists, born († 1912). He found simpler proofs that π and e are transcendental. Emmy Noether, the first woman to get a doctorate in Germany, was his student.
- 1843 Felix Müller born. He compiled the earliest mathematical calendar (that I know of). [Muller]
- 1961 Patent issued for multilayer circuit boards.
- 1962 The Netherlands issued a stamp showing Christiaan Huygens' Pendulum Clock as pictured by van Ceulen. [Scott #B365]

28 April

- 1686 Newton shows the handwritten copy of his *Principia* to the Royal Society. [Muller]
- 1693 Leibniz, in a letter to L'Hospital, explains his discovery of determinants. This work was fifty years before that of Cramer who was the real driving force in the development of determinants. Leibniz's work had no influence because it was not published until 1850 in his *Mathematische Schriften*. [Smith, *Source Book*, p. 267]
- 1765 Birthdate of Sylvester Françoise Lacroix († 1843), a textbook writer who was noted for his books on the calculus. He coined the phrase "analytic geometry." [DSB 7, 550]
- 1773 Robert Woodhouse born. He was interested in the "metaphysics of the calculus," i.e., questions such as the proper theoretical foundations of the calculus, the role of geometric and analytic methods, and the importance of notation. [DSB 14, 500]
- 1817 Gauss wrote the astronomer H. W. M. Olbers, "I am becoming more and more convinced that the necessity of our [Euclidean] geometry cannot be proved, at least not by *human* intellect nor for the human intellect." [G. E. Martin, *Foundations of Geometry and the Non-Euclidean Plane*, p. 306]
- 1831 Peter Guthrie Tait born in Dalkerth, Scotland.
- 1903 Josiah Willard Gibbs died.
- 1906 Kurt Gödel born.
- 1983 Greece issued a stamp portraying Archimedes and his Hydrostatic Principle. [Scott #1460]

29 April

- 1667 Birthdate of John Arbuthnot († 1735), fellow of the Royal College of Physicians. In 1710, his paper "An argument for divine providence taken from the constant regularity observ'd in the birth of both sexes" gave the first example of statistical inference. In his day he was famous for his political satires, from which we still know the character John Bull. See DSB 1, 208.
- 1850 William Edward Story born in Boston. He taught at Johns Hopkins with Sylvester and then moved on to Clark University which was, during the early 1890's, the strongest mathematics department in the country. In the 1890's he edited the short lived *Mathematical Reviews*.
- 1854 Lincoln University, the first university for Blacks, incorporated.
- 1854 Jules Henri Poincaré born in Nancy, France. He did important work in function theory, algebraic geometry, number theory, algebra, celestial mechanics, differential equations, mathematical physics, algebraic topology, and philosophy of mathematics. There may never be another universal mathematician like Poincaré. [DSB 11, 51]

- 1897 Thomson announced the discovery of the electron.
- 1902 “A billion does not strike the average mind as a very great number in this day of billion dollar trusts, yet a scientist has computed that at 10:40 A.M., April 29, 1902, only a billion minutes had elapsed since the birth of Christ.” Precisely when, according to this result, was Christ born? [Quoted by William F. White in *A Scrap-Book of Elementary Mathematics* (1942), p. 9]
- 1926 Vera Nikolaevna Maslennikova born. Gel’fond supervised her diploma work at Moscow and Sobolev directed her Ph.D. at the Steklov Mathematical Institute. She has published more than 80 papers in the theory of partial differential equations, the mathematical hydrodynamics of rotating fluids, and in function spaces. For more information see the *AWM Newsletter*, vol. 19(1989), no. 2, pp. 10–11.
- 1925 The first woman, F. R. Sabin, is elected to the National Academy of Sciences (Kane, p. 945). When was the first woman mathematician elected?
- 1931 Robert Lee Moore elected to the National Academy of Sciences.

30 April

- 1633 Galileo was forced to recant his scientific findings related to the Copernican Theory as “abjured, cursed and detested” by the Inquisition. He was placed under house arrest for the remaining nine years of his life. Legend had it that when Galileo rose from kneeling before his inquisitors, he murmured, “e pur, si mouve”—“even so, it does move.”
- 1777 Karl Friedrich Gauss born in Brunswick, Germany († 1855). His poorly educated mother couldn’t remember his birthdate, but could relate it to a movable religious feast. To confirm the date of his birth Gauss developed a formula for the date of Easter. [Reference needed. Probably in Dunningham]
- 1807 Gauss, on this birthday, wrote Sophie Germain thanking her for intervening with the French General Pernety on his behalf. [Thanks to Howard Eves]
- 1837 Massachusetts became the first state to establish a board of education.
- 1904 George Stibitz born.
- 1916 Claude Shannon born.
- 1957 Konrad Knopp died. He is famous for his work on infinite series.
- 1982 *Science* (pp. 505–506) reported that Stanford magician-statistician Perci Diaconis solved the problem of which arrangements of a deck of cards can occur after repeated perfect riffle shuffles. The answer involves M^{12} , one of the Mathieu simple groups. *Mathematics Magazine* 55 (1982), p. 245].
- 1984 30 April–4 May 1984. Teacher Appreciation Week. Celebrated the first week of May in Flint, MI. [Chase]
- 1992 *The New York Times* “in describing the discovery of the new Mersenne prime, felt it necessary to describe the series of primes, which, (according to them) goes: 1, 2, 3, 5, 7, 11, 13, You will notice that they have slipped in what must be another discover (by one of their wirters?) of the world’s smallest prime: 1. I’m sure the mathematicians of the world must be tearing their hair out for having missed this one.” [A posting of Ron Rivest to the net.]
- Walpurgis night or Witches’ Sabbath is celebrated on the eve of May Day, particularly by university students in northern Europe.