

# A Chronicle of Mathematical Milestones



# A Chronicle of Mathematical Milestones:

*The Mathematical Calendar*

By

Nataliya Ivanova

Cambridge  
Scholars  
Publishing



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This book first published 2024

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

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ISBN (10): 1-5275-6142-9

ISBN (13): 978-1-5275-6142-7

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# CHAPTER ONE

## JANUARY

### January, 1

- 1748 - Death of Johann Bernoulli, Swiss mathematician (b. 1667).
- 1787 - Death of Jose Anastacio da Cunha, Portuguese mathematician (b. 1744).
- 1796 - Death of Alexandre-Theophile Vandermonde, French mathematician (b. 1735).
- 1800 - Cauchy's father was elected Secretary of the Senate in France. The young Cauchy used a corner of his father's office in the Luxembourg Palace for his own desk. There, Lagrange and Laplace would often meet him. [11]
- 1803 - Birthdate of Guglielmo Libri Carucci dalla Sommaja, Italian count and mathematician (d. 1869).
- 1862 - Death of Mikhail Ostrogradsky, Ukrainian mathematician and physicist (b. 1801).
- 1878 - Birthdate of Agner Krarup Erlang, Danish mathematician, statistician, and engineer (d. 1929).
- 1894 - Birthdate of Satyendra Nath Bose, Indian physicist and mathematician (d. 1974).
- 1902 - Death of Lothar Heffter (b. 1862).
- 1905 - Birthdate of Stanislaw Mazur, Ukrainian-Polish mathematician (d. 1981).
- 1912 - Birthdate of Boris Vladimirovich Gnedenko, Russian mathematician and historian (d. 1995).
- 1922 - Death of Wooster Woodruff Beman, American mathematician, philologist, and historian of mathematics (b. 1850).
- 1923 - Birthdate of Alexander (Smbat) Abian, Iranian-born Armenian-American mathematician (d. 1999).
- 1923 - Birthdate of Daniel E. Gorenstein, American mathematician (d. 1992).
- 1938 - Hungary issued a stamp portraying Pope Sylvester II, Archbishop of Astrik (also known as mathematician Gerbert of Aurillac).
- 1940 - The first item was added to MathSciNet.

1995 - Death of Eugene Wigner, Hungarian-American physicist and mathematician, and Nobel Prize laureate (b. 1902).

1996 - Death of Gertrude Blanch, American mathematician (b. 1897).

## January, 2

1539 - Zuan Antonio de Bassano, a bookseller who frequently traveled between Milan and Venice (he took messages between Cardano and Tartaglia), wrote to Tartaglia: "Master Niccolo Tartaglia, I have been directed to you by a worthy man, a physician of Milan, named Master Girolamo Cardano, who is a very great mathematician. And because he has understood that you have been engaged in disputation with Master Fior, putting to him for a wager certain question that could only be answered by knowing the general rule for resolving the case of the cubic, which general rule you had found by your own discovery. Therefore his excellency prays you that you will kindly make known to him the rule discovered by you, and if you think it will make it public under your name in his present work, but if you do not think fit that it should be published he will keep it secret."

1663 - The Republic of Venice offered Stefano Degli Angeli a professorship of mathematics at the University of Padua, a post Galileo had held earlier.

1690 - The Hamburg Mathematical Society was founded.

1803 - Birthdate of Guglielmo Libri Carucci dalla Sommaja, Italian mathematician (d. 1869).

1822 - Birthdate of Rudolf Clausius, Polish-German physicist, and mathematician (d. 1888).

1892 - Day of death of George Biddell Airy, English mathematician, and astronomer (b. 1801).

1905 - Birthdate of Lev Genrikhovich Schnirelmann, Soviet mathematician (d. 1938).

1923 - Birthdate of Philip J. Davis, American academic applied mathematician, and writer.

1938 - Birthdate of Anatoly Mykhailovych Samoilenko, Ukrainian mathematician (d. 2020).

1940 - Birthdate of Sathamangalam Ranga Iyengar Srinivasa Varadhan, Indian-American mathematician.

1947 - Matt Weinstock's column in the Los Angeles Daily News began: "Readers of Esquire magazine [January 1948] ... are slowly losing their minds over a story by Martin Gardner" entitled the "No-Sided



Professor." This story is the first time that the Mobius strip, a one-sided surface, was used in a piece of fantasy.

1992 - Day of death of Brian Kuttner, British mathematician (b. 1908).

### January, 3

1641 - Day of death of Jeremiah Horrocks, English astronomer, and mathematician (b. 1618).

1657 - Fermat posed two problems involving  $S(n)$ , the sum of the proper divisors of  $n$ : (i) find a cube  $n$  such that  $n+S(n)$  is a square, and (ii) find a square  $n$  such that  $n+S(n)$  is a cube.

1777 - Birthdate of Louis Poincot, French mathematician, and physicist (d. 1859).

1891 - Day of death of John Casey, Irish mathematician (b. 1820).

1892 - Day of death of Heinrich Eduard Schroeter, German mathematician (b. 1829).

1912 - Day of death of Jacob Amsler, Swiss mathematician (b. 1823).

1917 - Birthdate of Yurii Alekseevich Mitropolskiy, Ukrainian mathematician (d. 2008).

1920 - Day of death of Zygmunt Janiszewski, Polish mathematician (b. 1888).

1921 - Birthdate of Isabella Bashmakova, Russian historian of mathematics (d. 2005).

1921 - Birthdate of Jean-Louis Koszul, French mathematician (d. 2018).

1927 - Day of death of Carl David Tolme Runge, German physicist, and mathematician (b. 1856).

1943 - Barbara Lee Wilson wrote to Einstein for advice on how to stop being anxious about her performance in math class. Her letter began as: "Most of the girls in my room have heroes which they write fan mail to. You + my uncle, who is in the Coast Guard, are my heroes."

1956 - Israel issued the world's first postage stamp picturing Albert Einstein.

1970 - Yuri Matiyasevich completes the proof of Hilbert's 10th Problem.

1975 - Birthdate of Danica McKellar, American actress, mathematical writer, and mathematician.

1977 - Apple Computer Corporation is incorporated by Stephen Jobs and Stephen Wozniak.

1989 - Day of death of Sergei Sobolev, Soviet mathematician (b. 1909).

2011 - Day of death of Anatoliy Volodymyrovych Skorokhod, Soviet-Ukrainian mathematician (b. 1930).

2018 - On this day it was announced that the Great Internet Mersenne Prime Search (GIMPS) has discovered the largest known prime number,  $2^{77,232,917} - 1$ , having 23,249,425 digits.

### January, 4

1567 - Birthdate of François d'Aguilon, Belgian Jesuit mathematician (d. 1617).

1643 - Birthdate of Isaac Newton, English mathematician, and physicist (d. 1727).

1752 - Day of death of Gabriel Cramer, Swiss mathematician, and physicist (b. 1704).

1826 - Day of death of Nikolai Fuss, Swiss mathematician (b. 1755).

1831 - Galois was expelled from the Ecole Normale for his political views.

1845 - Giusto Bellavitis was appointed, via a competitive examination, a full professor of descriptive geometry at the University of Padua.

1848 - Birthdate of Heinrich Suter, Swiss historian of mathematics (d. 1922).

1890 - Birthdate of Raymond Woodard Brink, American mathematician (d. 1973).

1913 - Birthdate of Sixto Rios Garcia, Spanish mathematician (d. 2008).

1948 - Birthdate of Alexander Bogomolny, Soviet-born Israeli American mathematician (d. 2018).

1950 - Day of death of Virgil Snyder, American mathematician (b. 1869).

1961 - Day of death of Erwin Schrödinger, Austrian theoretical physicist (b. 1887).

2005 - Day of death of Frank Harary, American mathematician (b. 1921).

### January, 5

1665 - The first volume of the Journal des Savants appeared in Paris. It was the first academic journal to publish scientific material.

1723 - Birthdate of Nicole-Reine Lepaute, French astronomer, and mathematician (d. 1788).

1838 - Birthdate of Camille Jordan, French mathematician (d. 1922).

1846 - Möbius, in a letter to Apelt, says that he has a copy of Grassmann's *Ausdehnungslehre* but failed to read beyond the first sheets [36].

1853 - The term "first derivative" first used as a noun in English in a paper "On the General Law of the Transformation of Energy" by William John Macquorn Rankine read before the Philosophical Society of Glasgow.

- 1855 - Birthdate of Gyula Valyi, Hungarian mathematician, and theoretical physicist (d. 1913).
- 1865 - Birthdate of Julio Garavito Armero, Colombian astronomer, mathematician, and engineer (d. 1920).
- 1871 - Birthdate of Federico Enriques, Italian mathematician (d. 1946).
- 1871 - Birthdate of Gino Fano, Italian mathematician (d. 1952).
- 1874 - In a letter to Dedekind, Cantor asked "Can a surface (say a square that includes the boundary) be uniquely referred to a line (say a straight line segment that includes the endpoints) so that for every point on the surface there is a corresponding point of the line and, conversely, for every point of the line, there is a corresponding point of the surface? I think that answering this question would be no easy job, despite the fact that the answer seems so clearly to be 'no' that proof appears almost unnecessary." [117].
- 1884 - Birthdate of Arnaud Denjoy, French mathematician (d. 1974).
- 1899 - Day of death of Ezra Otis Kendall, American professor, astronomer, and mathematician (b. 1818).
- 1900 - Minkowski responds to Hilbert (who had asked his opinion about possible topics for Hilbert's talk at the Second International Conference of Mathematicians in Paris) saying, "Most alluring would be the attempt at a look into the future and listing the problems on which mathematicians should try themselves during the coming century. With such a lecture, you could have people talking about your lecture decades later." [139].
- 1909 - Birthdate of Stephen Cole Kleene, American mathematician, and computer scientist (d. 1994).
- 1913 - Birthdate of Max Erich (Eric) Reissner, German-American civil engineer, and mathematician (d. 1996).
- 1951 - Day of death of Joseph Fels Ritt, American mathematician (b. 1893).
- 1970 - Day of death of Max Born, German physicist, and mathematician, Nobel Prize laureate (b. 1882).
- 1987 - Day of death of Josif Zakharovich Shtokalo, Soviet mathematician, and historian of mathematics (b. 1897).
- 1994 - Day of death of David Robert Bates, Irish mathematician, and physicist (b. 1916).

## January, 6

- 1561 - Birthdate of Thomas Fincke, Danish mathematician, and physicist (d. 1656).

- 1607 - Guidobaldo Marchese del Monte, Italian mathematician, philosopher, and astronomer (b. 1545).
- 1654 - Birthdate of Jakob Bernoulli, Swiss mathematician (d. 1705).
- 1689 - Day of death of Seth Ward, English bishop, mathematician, and astronomer (b. 1617).
- 1699 - Newton wrote to Flamsteed, probably alluding to Bernoulli's challenge of the brachistochrone problem, "I do not love... to be dunned and teezed by foreigners about Mathematical things..." [180].
- 1807 - Birthdate of Joseph Petzval, German-Hungarian mathematician, and physicist (d. 1891).
- 1819 - Gauss, in a letter to his former student, Christian Ludwig Gerling, describes how he came to his construction of the 17-gon while still in bed.
- 1841 - Birthdate of Friedrich Otto Rudolf Sturm, German mathematician (d. 1919).
- 1883 - Birthdate of Francisco Jose Duarte, Venezuelan mathematician (d. 1972).
- 1886 - Adhémar Jean Claude Barré de Saint-Venant, French mechanician, and mathematician (b. 1797).
- 1900 - Gottlob Frege wrote to David Hilbert: "Suppose we know that the propositions (1) A is an intelligent being, (2) A is omnipresent, (3) A is omnipotent, together with all their consequences did not contradict one another; could we infer from this that there was an omnipotent, omnipresent, intelligent being?" [47].
- 1918 - Day of death of Georg Cantor, German mathematician, and philosopher (b. 1845).
- 1920 - Day of death of Hieronymus Georg Zeuthen, Danish mathematician (b. 1839).
- 1922 - Day of death of Jakob Rosanes, Ukrainian-German mathematician, and chess player (b. 1842).
- 1930 - Day of death of Eduard Study, German mathematician (b. 1862).
- 1953 - Day of death of Giovanni Enrico Eugenio Vacca, Italian mathematician, and historian of science (b. 1872).
- 2018 -  $\phi$  day (is about the 'golden ratio.' The next date that aligns is not for another hundred years, on 6 Jan 2118 (1/6/18).

## January, 7

- 1451 - University of Glasgow was founded.
- 1610 - Galileo Galilei discovered the first three moons of Jupiter, or the Medicean Stars, as he called them.

- 1734 - Leonhard Euler and Katharina Gsell were married\*.
- 1810 - Gauss wrote to his friend Bessel: "This winter I am teaching two courses for three listeners, of whom one is only modestly prepared, one scarcely modestly prepared, and the third lacks preparation as well as ability. These are the onera of a mathematical professor."
- 1859 - Birthdate of Marie Georges Humbert, French mathematician (d. 1921).
- 1871 - Birthdate of Émile Borel, French mathematician, and politician (d. 1956).
- 1886 - Nature Magazine quotes from Sylvester's inaugural address at Oxford related to his meeting with Poincaré: "What Briggs said of logarithmes may be said almost in the same words of the subject of this lecture, "This most excellent help to geometry which, being found out, one wonders nobody else fount it out before; when now known, it is so easy."
- 1893 - Day of death of Josef Stefan, Slovenian physicist, and mathematician (b. 1835).
- 1904 - Birthdate of Gordon Thomas Whyburn, American mathematician (d. 1969).
- 1907 - Birthdate of Raymond Edward Alan Christopher Paley, English mathematician (d. 1933).
- 1935 - Day of death of Ivan Vsevolodovich Meshchersky, Soviet mathematician (b. 1859).
- 1943 - Einstein replies to the January 3 letter of Barbara Lee Wilson: " Do not worry about your difficulties in Mathematics. I can assure you mine are still greater."
- 1947 - History of Mathematics department established at Brown University.
- 1974 - Day of death of Charles Alfred Coulson, British applied mathematician, theoretical chemist, and religious author (b. 1910).
- 1981 - Cathleen S. Morawetz became the first female to deliver the (54th) Gibbs Lecture entitled "The mathematical approach to the sound barrier."
- 1989 - Day of death of John Frank Adams, English mathematician (b. 1930).
- 1998 - Day of death of Richard Hamming, American mathematician.
- 2012 - Day of death of Herbert Wilf, American mathematician (b. 1931).
- 2016 - The 49th Mersenne prime  $2^{74\,207\,281} - 1$  is discovered.

\*Gottlob Juncker wrote a poem celebrating the wedding:  
 Who would have thought it,  
 That our Euler should be in love?  
 Day and night he thought constantly,

How he wanted more to calculate numbers,  
His profound learned sense was free.

## January, 8

- 1642 - Day of death of Galileo Galilei, Italian physicist, mathematician, astronomer, and philosopher (b. 1564).
- 1713 - A complete copy of the report *Commercium Epistolicum D. Johannis Collins et aliorum de analysi promota* (on the priority of Newton in discovering calculus) was laid before the Royal Society; and Newton, as president, ordered a copy to be delivered to each person of the Committee appointed for this purpose, to examine it before publication [22].
- 1730 - In a letter to Goldbach, Euler admits that he is unable to do anything with Fermat's theorem [104]. He also first presents an integral representation of the interpolating function of the factorials. Today we would write this as  $n! = \int_0^1 (-\ln(x))^n dx$ .
- 1746 - Of his early reception in Berlin, Euler wrote to the Basel-born chaplain Johann Caspar Wettstein: "I can do just what I wish [in my research]... The king calls me his professor, and I think I am the happiest man in the world."
- 1816 - Sophie Germain did not appear at the awards ceremony for a prize offered by the Institut de France on the mathematical theory of elastic surfaces.
- 1829 - Birthdate of Heinrich Eduard Schroeter, German mathematician (d. 1892).
- 1852 - Birthdate of Giovanni Frattini, Italian mathematician (d. 1925).
- 1869 - The term "variety" arose as a translation by E. Beltrami (inspired by Gauss) of the German term "Mannigfaltigkeit" used by Riemann; nowadays, this term is usually translated as "manifold". The following correspondence, from Aldo Brigaglia to Steven Kleiman, contains more details: "I believe the usage of the word 'varietà' by Italian geometers arose from the (unpublished) Italian translation of Riemann's *Habilitationsvortrag*, which was later translated into French by J. Houel and published in the Italian journal *Annali*. Indeed, Beltrami wrote to Houel on 8 January 1869: 'J'ai traduit Mannigfaltigkeit par varietà, dans le sens de multitudo variarum rerum...' And later, on 14 February 1869, he wrote: 'Je croirais toujours convenable de traduire Mannigfaltigkeit par variété: j'ai remarqué que Gauss, dans ses *Mémoires sur les résidus biquadratiques* appelle en latin *varietas* la même chose qui, dans les *comptes-rendus* rédige par

lui-même en allemand dans les *Gelehrte Anzeige*, est désignée par *Mannigfaltigkeit*.' [13, 149]".

1888 - Birthdate of Richard Courant, German-American mathematician (d. 1972).

1889 - Dr. Herman Hollerith received patent no. 395,782 for the first tabulating machine [81].

1917 - Birthdate of Leonard E. Gillman, American mathematician (d. 2009).

1924 - Birthdate of Paul Moritz Cohn, German-British mathematician (d. 2006).

1931 - Birthdate of Andrew Browder, American mathematician (d. 2019).

1939 - Birthdate of Alan Wilson, English mathematician.

1942 - Birthdate of Stephen W. Hawking, English theoretical physicist.

1947 - Norbert Wiener refused to address a Harvard symposium on computers because they were used "for war work" and announced he would not publish work "which may do damage in the hands of irresponsible militarists."

1952 - Birthdate of Peter McCullagh, Irish mathematician.

1968 - Day of death of Charles Loewner, American mathematician (b. 1893).

## January, 9

1621 - J. Welles writes to Henry Briggs at Merton College in Oxford to offer help in the construction of logarithms for base ten [143].

1757 - Day of death of Louis Bertrand Castel, French mathematician, and philosopher (b. 1688).

1799 - Day of death of Maria Gaetana Agnesi, Italian mathematician, and philosopher (b. 1718).

1839 - Thomas Henderson announced the first stellar parallax [75].

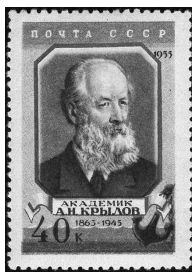
1864 - Birthdate of Vladimir Steklov, Russian mathematician, and physicist (d. 1926).

1873 - Birthdate of Hans Blichfeldt, American mathematician (d. 1945).

1916 - Birthdate of Peter Twinn, English mathematician, and entomologist (d. 2004).

1922 - Graustein, at a meeting of the Harvard Division of Mathematics, read the letter by an official of an American "organization for the assistance of German and Austrian science" (probably the "Emergency Society for German and Austrian Science and Art"), asking for advice as to possible support for the *Jahrbuch* [158].

- 1930 - Birthdate of Jacob Theodore (Jack) Schwartz, American mathematician, and computer scientist (d. 2009).
- 1937 - Nature publishes a poetic version of the generalization to  $N$  dimensions of Descartes' theorem on Apollonian circles by Thorold Gosset\* (see the June 20 entry for a poetic version of the original theorem).
- 1956 - The Soviet Union issued a stamp commemorating the tenth anniversary of the death of Alexei N. Krylov (1863-1945), mathematician, and naval architect.



- 1973 - Day of death of Harry Schultz Vandiver, American mathematician (b. 1882).
- 1975 - Day of death of Pyotr Novikov, Soviet mathematician (b. 1901).
- 1989 - Day of death of Marshall Harvey Stone, American mathematician (b. 1903).

\*The Kiss Precise (generalized) by Thorold Gosset

And let us not confine our cares  
 To simple circles, planes and spheres,  
 But rise to hyper ats and bends  
 Where kissing multiple appears,  
 In  $n$ -ic space the kissing pairs  
 Are hyperspheres, and Truth declares,  
 As  $n + 2$  such osculate  
 Each with an  $n + 1$  fold mate  
 The square of the sum of all the bends  
 Is  $n$  times the sum of their squares.



## January, 10

- 1833 - Day of death of Adrien-Marie Legendre, French mathematician (b. 1752).
- 1844 - George Boole submitted his first paper to the Philosophical Transactions of the Royal Society.
- 1854 - Riemann presents a paper to the philosophical faculty at Göttingen in which he described the Euclidean plane geometry and solid geometry, respectively, as two- and three-dimensional examples of what we now call Riemann spaces with zero curvature. Saying that the space is curved, rather than flat or Euclidean, is another way of saying that the familiar properties of Euclidean geometry (such as the Pythagorean theorem) do not hold. He went on to suggest that all physical laws become simpler when expressed in higher dimensions [111].
- 1875 - Birthdate of Issai Schur, German mathematician (d. 1941).
- 1891 - Birthdate of Heinrich Behmann, German mathematician (d. 1970).
- 1905 - Birthdate of Ruth Moufang, German mathematician (d. 1977).
- 1906 - Birthdate of Grigore Constantin Moisil, Romanian mathematician, computer pioneer (d. 1973).
- 1929 - Day of death of Karl Heun, German mathematician (b. 1859).
- 1938 - Birthdate of Donald Knuth, American computer scientist, and mathematician.
- 1941 - Day of death of Issai Schur, Belarusian-German mathematician (b. 1875).
- 1944 - Day of death of Thomas Scott Fiske, American mathematician (b. 1865).
- 1949 - Birthdate of Ann Watkins, American mathematician.
- 1984 - Day of death of Lancelot Stephen Bosanquet, British mathematician (b. 1903).
- 1988 - Postage stamps for Euclid and Newton are issued by the Maldivé Islands.



**January, 11**

- 1545 - Birthdate of Guidobaldo Marchese del Monte, Italian mathematician, philosopher, and astronomer (d. 1607).
- 1672 - Newton presented his telescope to the Royal Society of London. At the same meeting, he was elected a Fellow of the Royal Society.
- 1707 - Birthdate of Vincenzo Riccati, Italian mathematician, and physicist (d. 1775).
- 1734 - Birthdate of Achille-Pierre Dionis du Sejour, French mathematician, astronomer, and politician (d. 1794).
- 1750 - Birthdate of Isaac Milner, British mathematician (d. 1820).
- 1757 - Day of death of Louis Bertrand Castel, French mathematician (b. 1688).
- 1775 - Gaspard Monge presented a memoir before the Académie des Sciences in which he made use of two planes of projection in his descriptive geometry.
- 1787 - Friedrich Wilhelm Herschel discovered the first two moons of Uranus, Titania and Oberon.
- 1825 - Birthdate of William Spottiswoode, English mathematician, and physicist (d. 1883).
- 1826 - Birthdate of Giuseppe Battaglini, Italian mathematician (d. 1894).
- 1845 - Birthdate of Albert Victor Backlund, Swedish mathematician, and physicist (d. 1912).
- 1858 - In his letter to Engels, Marx writes: "I am so damnedly held up by mistakes in calculation in the working out of the economic principles that out of despair I intend to master algebra promptly. Arithmetic remains foreign to me. But I am again shooting my way rapidly along the algebraic route." [113].
- 1902 - Popular Mechanics magazine is published for the first time.
- 1903 - Day of death of Henry William Watson, English mathematician (b. 1827).
- 1911 - The "Kaiser Wilhelm Society for the Advancement of Science" was founded in Berlin. This became the present Max Planck Society.
- 1914 - Birthdate of George Brinton Thomas Jr., American mathematician (d. 2006).
- 1915 - The Times of London ran a column entitled "A Mathematical War" on the importance and use of mathematics in warfare [7].
- 1941 - Day of death of Emanuel Lasker, German mathematician, philosopher, and chess player (b. 1868).
- 1947 - Day of death of Edward Ross, Scottish mathematician (b. 1881).

- 1949 - Day of death of Torsten Carleman, Swedish mathematician (b. 1892).  
 2018 - Day of death of Michael Atiyah, British-Lebanese mathematician (b. 1929).

## January, 12

- 1665 - Day of death of Pierre de Fermat, French mathematician, and lawyer (b. 1601).  
 1721 - John Hadley presented at a meeting of the Royal Society a reflecting telescope that magnified 200 times and was made according to Newton's plan.  
 1820 - Founding of the Royal Astronomical Society of England.  
 1828 - The term "equations modulaires" (modular equations) appears first in a letter written by Jacobi to Legendre.  
 1853 - Birthdate of Gregorio Ricci-Curbastro, Italian mathematician (d. 1925).  
 1906 - Birthdate of Kurt Hirsch, German-British mathematician (d. 1986).  
 1909 - Day of death of Hermann Minkowski, Lithuanian-German mathematician (b. 1864).  
 1915 - Birthdate of Herbert Ellis Robbins, American mathematician, and statistician (d. 2001).  
 1920 - Ramanujan wrote to Hardy about his discovery of mock theta functions [1].  
 1946 - Day of death of Jean-Louis Loday, French mathematician (d. 2012).  
 1996 - Day of death of Joachim Nitsche, German mathematician (b. 1926).  
 1996 - Day of death of Bartel Leendert van der Waerden, Dutch mathematician, and historian of mathematics (b. 1903).  
 2004 - Day of death of Olga Ladyzhenskaya, Russian mathematician (b. 1921).  
 2018 - Day of death of Jean-Louis Koszul, French mathematician (b. 1921).

## January, 13

- 1659 - Hendrik van Heuraet sent Frans van Schooten his rectification of the semi-cubical parabola.  
 1852 - William Rowan Hamilton wrote to August De Morgan: "I see that either you or I – but I hope it will be you – must write, sometime or

- another, a history of the square root of  $-1$ ." (See January 18 entry for De Morgan's reply) [121].
- 1868 - Birthdate of Donald McIntosh, Scottish mathematician (d. 1957).
- 1876 - Birthdate of Luther Pfahler Eisenhart, American mathematician (d. 1965).
- 1876 - Birthdate of Erhard Schmidt, German mathematician (d. 1959).
- 1900 - Birthdate of Gertrude Cox, American statistician (d. 1978).
- 1902 - Birthdate of Karl Menger, Austrian-American mathematician from the Vienna Circle (d. 1985).
- 1911 - A. V. Vasil'ev gave a lecture entitled "Non-Euclidean Geometry and the Non-Aristotelian Logic." This is his claim to the discovery of three-valued logics.
- 2013 - Day of death of Chia-Chiao Lin, Chinese-American mathematician (b. 1916).

## January, 14

- 1650 - Descartes' lectures started in Stockholm during the coldest winter for over 60 years (the cold caused fatal pneumonia a few days later) [163].
- 1679 - Day of death of Jacques de Billy, French mathematician (b. 1602).
- 1684 - Birthdate of Johann Matthias Hase, German mathematician, astronomer, and cartographer (d. 1742).
- 1687 - Day of death of Nicholas (Nikolaus) Mercator (b. 1620).
- 1742 - Day of death of Edmond Halley, English astronomer, geophysicist, mathematician, meteorologist, and physicist (b. 1656).
- 1753 - Day of death of George Berkeley, English mathematician (b. 1685).
- 1814 - Day of death of Charles Bossut, French mathematician (b. 1730).
- 1819 - Birthdate of James Cockle, English mathematician (d. 1895).
- 1858 - Arthur Cayley's A Memoir on the Theory of Matrices is read at the Royal Society.
- 1874 - Day of death of Ernst Wilhelm Grebe, German mathematician (b. 1804).
- 1887 - Birthdate of Hugo Steinhaus, Polish mathematician (d. 1972).
- 1898 - Day of death of Charles Lutwidge Dodgson (aka Lewis Carroll), English novelist, poet, and mathematician (b. 1832).
- 1901 - Birthdate of Alfred Tarski, Polish-American mathematician and philosopher (d. 1983).
- 1901 - Day of death of Charles Hermite, French mathematician (b. 1822).
- 1912 - Day of death of Arnold Droz-Farny, Swiss mathematician (b. 1856).

- 1914 - Day of death of Benjamin Osgood Peirce, American mathematician (b. 1854).
- 1924 - Birthdate of Linards Eduardovich Reizins, Soviet mathematician (d. 1991).
- 1931 - Day of death of William Ernest Johnson, British logician (b. 1858).
- 1970 - Day of death of William Feller, Croatian-American mathematician (b. 1906).
- 1978 - Day of death of Kurt Gödel, Austrian-American mathematician and philosopher (b. 1906).
- 1980 - Robert J. Griess, Jr. announced that he had constructed the conjectured sporadic simple group  $F_1$  known as the monster. This group consists of 808,017,424,794,512,875,886,459,904,961,710,757,005,754,368,000,000 square matrices each of size 196,883 by 196,883. This led to the completion of the classification of the finite simple groups. [62].
- 1993 - Germany issued a postage stamp for the 350 years of Newton's birthday.



- 2014 - Day of death of Milutin Dostanic, Serbian mathematician (b. 1958).
- 2020 - Zentralblatt MATH announces that zbMATH becomes an open-access platform.

## January, 15

- 1704 - Birthdate of Johann Castillon, Italian mathematician (d. 1791).
- 1717 - Birthdate of Matthew Stewart, Scottish geometer (d. 1785).
- 1790 - Day of death of John Landen, English mathematician (b. 1719).
- 1814 - Birthdate of Ludwig Schläi, Swiss mathematician (d. 1895).
- 1827 - Gauss wrote to his friend Schumacher that his ideas on non-Euclidean Geometry, published in a book review in 1816, were "besmirched with mud" by critics.
- 1850 - Birthdate of Sofia Kovalevskaya, Russian-Swedish mathematician and physicist (d. 1891).
- 1866 - The first Annual General Meeting of the London Mathematical Society was held [140].

1876 - Birthdate of Robert Bell, Scottish mathematician (d. 1963).

1883 - Birthdate of James Mercer, British mathematician (d. 1932).

1891 - The first bimagic square (where the numbers form a magic square, and when replaced by their squares, still form a magic square) was published in France [105], with only half of the numbers shown as a problem for the readers. The square is:

|    |    |    |    |    |    |
|----|----|----|----|----|----|
| 56 |    | 8  | 18 | 9  |    |
|    | 20 |    | 48 | 29 | 10 |
| 26 |    | 13 | 64 | 4  |    |
|    | 5  |    | 30 | 12 | 60 |
| 15 |    | 63 | 41 | 50 |    |
|    | 55 |    | 11 | 58 | 45 |
| 61 |    | 42 | 27 | 39 |    |
|    | 62 |    | 37 | 51 | 3  |

The solution was published on February 1, 1891.

1913 - Ramanujan sent his first letter to Hardy. In the pages that followed Ramanujan's one-page cover letter, he provides at least 11 more pages (at least two of which are now lost) containing technical results in topics ranging from work on infinite series and the gamma function, the distribution of prime numbers, hypergeometric series, continued fractions, elliptic functions, Bromwich's infinite series, divergent functions, a discussion of the Bernoulli numbers, and more. [172].

Letter from S. Ramanujan to G.H. Hardy (16 January 1913)

Dear Sir,

I beg to introduce myself to you as a clerk in the Accounts Department of the Port Trust Office at Madras on a salary of only £20 per annum. I am now about 23 years of age. I have had no University education but I have undergone the ordinary school course. After leaving school I have been employing the spare time at my disposal to work at Mathematics. I have not trodden through the conventional regular course which is followed in a University course, but I am striking out a new path for myself. I have made a special investigation of divergent series in general and the results I get are termed by the local mathematicians as "startling".

Just as in elementary mathematics you give a meaning to  $a^n$  when  $n$  is negative and fractional, to conform to the law which holds when  $n$  is a positive integer, similarly the whole of my investigations proceed on giving a meaning to Eulerian Second Integral for all values of  $n$ . My friends who have gone through the regular course of University education tell me that  $\text{eq. 11}$  is true only when  $n$  is positive. They say that this integral relation is not true when  $n$  is negative. Supposing this is true only for positive values of  $n$  and also supposing the definition  $\text{eq. 21}$  to be universally true, I have given meanings to these integrals and under the conditions I state the integral is true for all values of  $n$  negative and fractional. My whole investigations are based upon this and I have been developing this to a remarkable extent so much so that the local mathematicians are not able to understand me in my higher flights.

Very recently I came across a tract published by you styled Orders of Infinity in page 36 of which I find a statement that no definite expression has been as yet found for the number of prime numbers less than any given number. I have found an expression which very nearly approximates to the real result, the error being negligible. I would request you to go through the enclosed papers. Being poor, if you are convinced that there is anything of value I would like to have my theorems published. I have not given the actual investigations nor the expressions that I get but I have indicated the lines on which I proceed. Being inexperienced I would very highly value any advice you give me. Requesting to be excused for the trouble I give you.

I remain, Dear Sir, Yours truly,  
S. Ramanujan

P.S. My address is S. Ramanujan, Clerk Accounts Department, Port Trust, Madras, India

- 1918 - Noether gave a lecture before the Mathematical Society in Göttingen, entitled "Über Invarianten beliebiger Differentialausdrücke" (On invariants of arbitrary differential forms) [38].
- 1925 - Birthdate of James Laurie Snell, American mathematician (d. 2011).
- 1945 - Day of death of Wilhelm Wirtinger, Austrian-German mathematician (b. 1865).
- 1950 - John Nash's paper "Equilibrium Points in n-Person Games" was published by the National Academy of Sciences of the USA [122].
- 1958 - Day of death of Aurel Wintner, Hungarian-American mathematician (d. 1903).
- 1973 - Day of death of Ivan Petrovsky, Soviet mathematician (b. 1901).
- 2001 - Wikipedia was formally launched on January 15, 2001, by Jimmy Wales and Larry Sanger, using the concept and technology of a wiki pioneered in 1995 by Ward Cunningham.

## January, 16

- 1777 - Euler last attended a meeting of the St. Petersburg Academy on this date; later on, he was communicating with the Academy via assistants only [150].
- 1801 - Birthdate of Thomas Clausen, Danish mathematician, and astronomer (d. 1885).
- 1826 - Niels Abel wrote to his former teacher Bernt Holmboe: "The divergent series are the invention of the devil." [93].
- 1832 - Janos Bolyai's pioneering work The Absolutely True Science of Space was published and sent to Gauss for the second time.
- 1834 - Day of death of Jean Nicolas Pierre Hachette, French mathematician (b. 1769).
- 1865 - Founding of the London Mathematical Society.
- 1906 - Birthdate of Erich Kahler, German mathematician (d. 2000).
- 1910 - Richard Courant was scheduled to be examined for his Ph.D. by Hilbert in mathematics, Voight in physics, and Husserl in philosophy.
- 1913 - Srinivasa Ramanujan, a 23-year-old clerk in Madras, India, wrote G. H. Hardy, Professor at Cambridge, sending "a few examples of my theorems" and asking for advice.
- 1922 - Day of death of Pierre Rene Jean Baptiste Henri Brocard, French mathematician (b. 1845).
- 1925 - Birthdate of Germund Dahlquist, Swedish mathematician (d. 2005).
- 1939 - When around 1938-1939 voices were raised in the AMS that cast doubts on the objectivity of the abstracts in Zentralblatt, the

mathematician Arthur B. Coble wrote in a letter to G. D. Birkhoff: "Unless it would appear in the future that the reviews in the Zentralblatt are biased, I can see no reason why the Society should take any steps in the matter... I might add that the only recent criticism of a Zentralblatt review that I have heard was from an American author who complained that the American referee had completely missed the point of his article. In other words, even under the most favorable circumstances, the abstract journal will sometimes be at fault." [158].

### **January, 17**

- 1492 - Birthdate of Adam Ries, German mathematician (d. 1559).
- 1574 - Birthdate of Robert Fludd, English physician, astrologer, and mathematician (d. 1637).
- 1618 - Day of death of Luca Valerio, Italian mathematician (b. 1552).
- 1670 - Day of death of Jean Leurechon, French Jesuit priest, and mathematician (b. 1591).
- 1775 - Day of death of Vincenzo Riccati, Italian mathematician, and physicist (b. 1707).
- 1798 - Birthdate of Isidore Auguste Marie Francois Xavier Comte, French philosopher, and mathematician (d. 1857).
- 1831 - Galois submitted his work on the theory of equations following the advice of Simeon Poisson.
- 1881 - Birthdate of Antoni Lomnicki, Polish mathematician (d. 1941).
- 1858 - Birthdate of Gabriel Xavier Paul Koenigs, French mathematician (d. 1931).
- 1905 - Birthdate of Dattaraya Ramchandra Kaprekar, Indian mathematician (d. 1986).
- 1913 - Birthdate of Shaun Wylie, British mathematician (d. 2009).
- 1954 - Day of death of Leonard Eugene Dickson, American mathematician (b. 1874).
- 1974 - Hewlett-Packard (HP) introduced the first programmable calculator, the HP-65.
- 2000 - Day of death of Eugene Ehrhart, French mathematician (b. 1906).

### **January, 18**

- 1758 - Day of death of François Nicole, French mathematician (b. 1683).
- 1802 - Gauss read in the newspaper that Olbers had rediscovered Ceres. Gauss wrote to Olbers to get his observations, which was the beginning of their friendship.



- 1844 - John Thomas Graves communicated to Sir William Hamilton his theorem respecting sums of eight squares. This is the basis of his work on Octonions.
- 1852 - De Morgan replied to Hamilton's January 13th letter: "As for a history of the square root of  $-1$ , it would be no small job to do it well from the Hindus downwards." Neither Hamilton nor De Morgan ever wrote such a history... [121]
- 1856 - Birthdate of Luigi Bianchi, Italian mathematician (d. 1928).
- 1865 - In a letter to Hirst, two days after the founding of the London Mathematical Society, Bompas expressed the hope that "if you meet any mathematician now, you always ask him to join us" [140].
- 1873 - Day of death of Pierre Charles François Dupin, French mathematician (b. 1784).
- 1880 - Birthdate of Paul Ehrenfest, Austrian and Dutch physicist, and mathematician (d. 1933).
- 1897 - The Indiana Pi Bill, aiming to change the value of  $\pi$  to 3 (and several other numbers, it seems), was first introduced.
- 1901 - Birthdate of Ivan Petrovsky, Soviet mathematician (d. 1973).
- 1908 - Birthdate of Jacob Bronowski, Polish-English mathematician, historian, and television host (d. 1974).
- 1963 - Day of death of Edward Charles Titchmarsh, English mathematician (b. 1899).
- 1981 - Day of death of Rufus Philip Isaacs, American mathematician (b. 1914).

## January, 19

- 1581 - Andreas Dudith wrote in a letter that observations of the comet of 1577 proved the Aristotelian explanation of comets being accidental exhalations of hot air from the earth that rise in the sublunar sphere is wrong.
- 1669 - Newton wrote to John Collins to provide a solution to a question about evaluating a series of fractions with a common numerator and denominators in an arithmetic sequence.
- 1730 - Euler replied to Goldbach with an outline of some of the integral methods he was using to analyze the form of the gamma function. He closed with a note: "I have been able to discover nothing about the observation noticed by Fermat [Fermat's conjecture that is prime]" [151].
- 1755 - Day of death of Jean-Pierre Christin, French physicist, mathematician, and astronomer (b. 1683).

- 1833 - Birthdate of Alfred Clebsch, German mathematician (d. 1872).
- 1851 - Birthdate of Emanuel Czuber, Austrian mathematician (d. 1925).
- 1879 - Birthdate of Guido Fubini, Italian-American mathematician (d. 1943).
- 1889 - Oskar Bolza gave his first lecture to a non-German audience. More precisely, he started a series of twenty lectures at Johns Hopkins "on the theory of substitution groups and its application to algebraic equations." This was the first course on Galois theory in this country.
- 1908 - Birthdate of Aleksandr Gennadievich Kurosh, Soviet mathematician (d. 1971).
- 1911 - Birthdate of Garrett Birkhoff, American mathematician (d. 1996).
- 1912 - Birthdate of Leonid Kantorovich, Soviet mathematician and economist, Nobel Prize laureate (d. 1986).
- 1917 - Birthdate of Graham Higman, English mathematician (d. 2008).
- 1930 - Day of death of Frank P. Ramsey, British mathematician, philosopher, and economist (b. 1903).
- 1954 - Day of death of Theodor Kaluza, German mathematician, and physicist (b. 1885).
- 1984 - Apple introduced the Macintosh computer during a 60-second commercial aired during the Super Bowl.
- 1986 - The first IBM PC computer virus is released.
- 2000 - Day of death of Hedy Lamarr, Austrian-American actress, singer, and mathematician (b. 1913).
- 2001 - Day of death of Paul Olum, American mathematician (b. 1918).
- 2007 - Day of death of Asger Hartvig Aaboe, American historian of the exact sciences and mathematician (b. 1922).
- 2016 - The Great Internet Mersenne Prime Search reported the discovery of the new record largest prime number,  $2^{74,207,281} - 1$ .

## January, 20

- 1526 - Birthdate of Rafael Bombelli, Italian mathematician (d. 1572).
- 1590 - Day of death of Giovanni Battista Benedetti, Italian mathematician (b. 1530).
- 1633 - Galileo left his home in Florence, Italy, to face the Inquisition in Rome.
- 1714 - Russian tsar Peter I (the Great) prohibited the dvorians (Russian aristocrats) from getting married unless they passed school courses in arithmetic and geometry.
- 1760 - Day of death of John Colson, English clergyman, and mathematician (b. 1680).

- 1775 - Birthdate of Andre-Marie Ampere, French physicist, and mathematician (d. 1836).
- 1831 - Birthdate of Edward John Routh, English mathematician (d. 1907).
- 1834 - Birthdate of William Watson, American mathematician (d. 1915).
- 1864 - Day of death of Giovanni Antonio Amedeo Plana, Italian astronomer, and mathematician (b. 1781).
- 1895 - Birthdate of Gabor Szego, Hungarian mathematician (d. 1985).
- 1904 - Birthdate of Renato Caccioppoli, Italian mathematician (d. 1959).
- 1939 - Birthdate of Chandra Wickramasinghe, Sri Lankan-English mathematician, astronomer, and biologist.
- 1971 - Day of death of Jan Arnoldus Schouten, Dutch mathematician (b. 1883).
- 2001 - Day of death of Crispin St. John Alvah Nash-Williams, British-Canadian mathematician (b. 1932).

## January, 21

- 1807 - The London Institution received a royal charter signed by King George III to "promote the diffusion of Science, Literature, and the Arts, by means of Lectures and Experiments, and by easy access to an extensive collection of books, both ancient and modern, in all languages."
- 1827 - Birthdate of Ivan Mikheevich Pervushin, Russian mathematician (d. 1900).
- 1844 - Augustus De Morgan wrote a confidential letter to Lady Noel Byron about her 28-year-old daughter, Augusta Ada King, the Countess of Lovelace, whom De Morgan had tutored as a private pupil in various areas of advanced mathematics for about eighteen months in the early 1840s. In his letter, while he was at pains to stress that "I have never expressed to Lady Lovelace my opinion of her as a student of these matters" [i.e. mathematics], De Morgan wrote: "I feel bound to tell you that the power of thinking on these matters which Lady L[ovelace] has always shown from the beginning of my correspondence with her has been something so utterly out of the common way for any beginner, man or woman, that this power must be duly considered by her friends, with reference to the question whether they should urge or check her obvious determination to try not only to reach but to get beyond the present bounds of knowledge."
- 1846 - Birthdate of Pieter Hendrik Schoute, Dutch mathematician (d. 1923).

- 1860 - Birthdate of David Eugene Smith, American mathematician, educator, and editor (d. 1944).
- 1874 - Birthdate of René-Louis Baire, French mathematician (d. 1932).
- 1882 - Birthdate of Pavel Florensky, Russian mathematician, and theologian (d. 1937).
- 1892 - Day of death of John Couch Adams, British mathematician, and astronomer (b. 1819).
- 1897 - Birthdate of Alexander Weinstein, Russian-American mathematician (d. 1979).
- 1915 - Birthdate of André Lichnerowicz, French mathematician (d. 1998).
- 1915 - Birthdate of Yuri Vladimirovich Linnik, Soviet mathematician (d. 1972).
- 1931 - Day of death of Cesare Burali-Forti, Italian mathematician (b. 1861).
- 1946 - Day of death of Harry Bateman, English mathematician (b. 1882).
- 1947 - Birthdate of Dorian M. Goldfeld, American mathematician.
- 1974 - Day of death of Arnaud Denjoy, French mathematician (b. 1884).

## January, 22

- 1592 - Birthdate of Pierre Gassendi, French mathematician, astronomer, and philosopher (d. 1655).
- 1673 - Leibniz presents a calculation machine at the Royal Society.
- 1833 - In his notebook, Gauss introduces the linking number of two knots [175].
- 1866 - Birthdate of Gustav de Vries, Dutch mathematician (d. 1934).
- 1867 - Thomson wrote to Helmholtz: "... a few days ago Tait showed me in Edinburgh a magnificent way of producing [vortex rings]. We sometimes can make one ring shoot through another, illustrating perfectly your description; when one ring passes near another, each is much disturbed and is seen to be in a state of violent vibration for a few seconds, till it settles again into its circular form... The vibrations make a beautiful subject for mathematical work."
- 1874 - Birthdate of Leonard Eugene Dickson, American mathematician (d. 1954).
- 1880 - Birthdate of Frigyes Riesz, Hungarian mathematician (d. 1956).
- 1889 - Oskar Bolza gave his first lecture to a non-German audience (the first from his twenty lectures "On the theory of substitution groups and its application to algebraic equations") at Johns Hopkins University.
- 1904 - Day of death of George Salmon, Irish mathematician (b. 1819).

- 1921 - Day of death of Marie Georges Humbert, French mathematician (b. 1859).
- 1922 - Day of death of Camille Jordan, French mathematician, and engineer (b. 1838).
- 1929 - Birthdate of Walter Volodymyr Petryshyn (Vladimir Petryshin), Ukrainian mathematician.
- 1936 - Day of death of Ramaswami Aiyar, Indian mathematician (b. 1871).
- 1951 - Day of death of Harald August Bohr, Danish mathematician (b. 1887).
- 1987 - Day of death of Patrick du Val, British mathematician (b. 1903).

### **January, 23**

- 1656 - Blaise Pascal wrote the first of his eighteen Provincial Letters.
- 1693 - Birthdate of Georg Bernhard Bilfinger, German philosopher, mathematician, statesman (d. 1750).
- 1719 - Birthdate of John Landen, English mathematician (d. 1790).
- 1731 - Euler wrote to Schumacher: "It seems to me that it is very disgraceful for me, that I, who up to now have had more salary than the others, shall now be set equal to them... I think that the number of those who have carried [mathematics] as far as I is pretty small in the whole of Europe, and none of them will come for 1000 rubles."
- 1785 - Day of death of Matthew Stewart, Scottish mathematician (b. 1717).
- 1806 - Birthdate of Ernst Ferdinand Adolf Minding, Russian mathematician (d. 1885).
- 1846 - Birthdate of Nikolay Umov, Russian physicist, and mathematician (d. 1915).
- 1853 - Day of death of Kazimierz Zorawski, Polish mathematician (b. 1853).
- 1862 - Birthdate of David Hilbert, Russian-German mathematician (d. 1943).
- 1880 - Birthdate of Friedrich Riesz, Hungarian mathematician (b. 1880).
- 1883 - The idea of creating the Edinburgh Mathematical Society was announced: A.Y. Fraser and A.J.G. Barclay (mathematics teachers) together with C.G. Knott, the professor of physics at the University of Edinburgh, sent out a letter dated 23 January 1883: "...to gentlemen in Edinburgh, in Cambridge, and throughout Scotland generally..." The letter asked for support for their project: "It is proposed to establish, primarily in connection with the University, a Society for the mutual

improvement of its members in the Mathematical Sciences, pure and applied. Amongst the methods by which this object might be attained may be mentioned: Reviews of works both British and Foreign, historical notes, discussions of new problems or new solutions, a comparison of the various systems of teaching in different countries, or any other means tending to the promotion of mathematical Education."

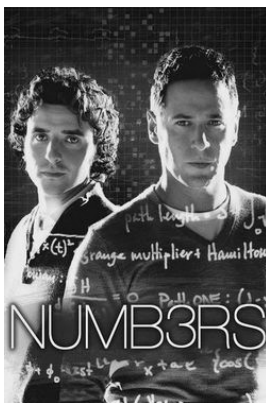
1913 - Andrei Andreyevich Markov addressed the Imperial Academy of Sciences in St. Petersburg, reading a paper "An example of statistical investigation of the text Eugene Onegin concerning the connection of samples in chains" [72].

1924 - Birthdate of Michael James Lighthill, British mathematician (d. 1998).

1946 - Birthdate of Boris Berezovsky, Russian-English businessman, and mathematician (d. 2013).

1947 - Birthdate of Peter Jephson Cameron, Australian mathematician.

2005 - The first episode of Numb3rs airs on CBS. The show is a standard police procedural with the twist that a mathematics professor is brought on as a consultant to help the FBI solve cases.



2017 - Russian schoolboy, Andrey S. Shchebetov, announced on his website that he had found a sequence of the first 126 numbers (125 of them never reported before) that take exactly 261 steps to reach a 119-digit palindrome. This sequence was published in OEIS as A281506. This sequence started with 1,186,060,307,891,929,990 – by then the only publicly known number found by Jason Doucette back in 2005 (see Nov. 30 entry).