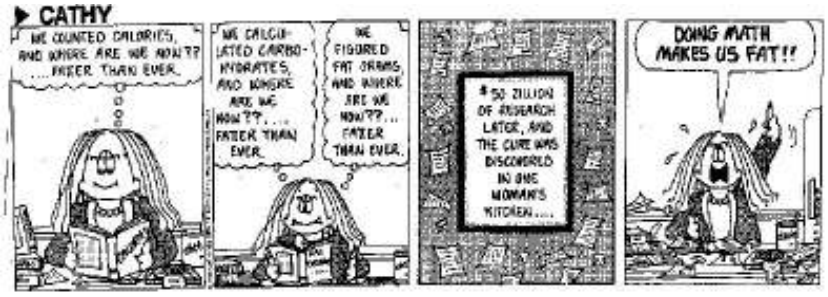
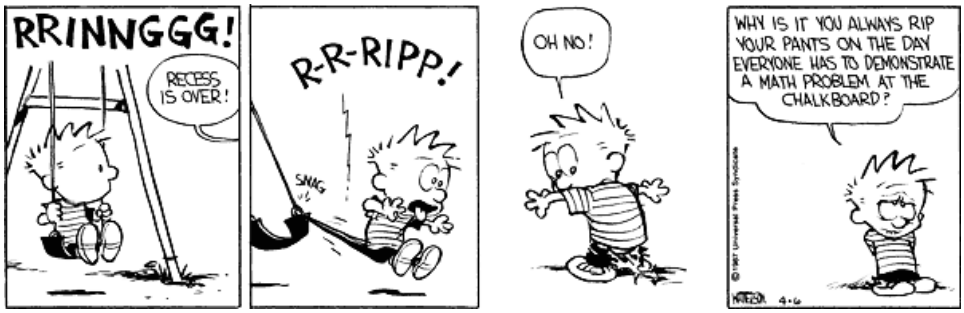
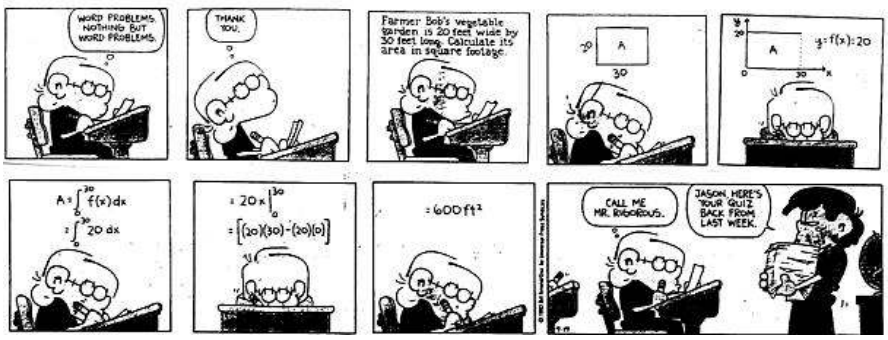
$$x^4-8196x^3+25188446x^2-34402062516x+17618342436585=0$$

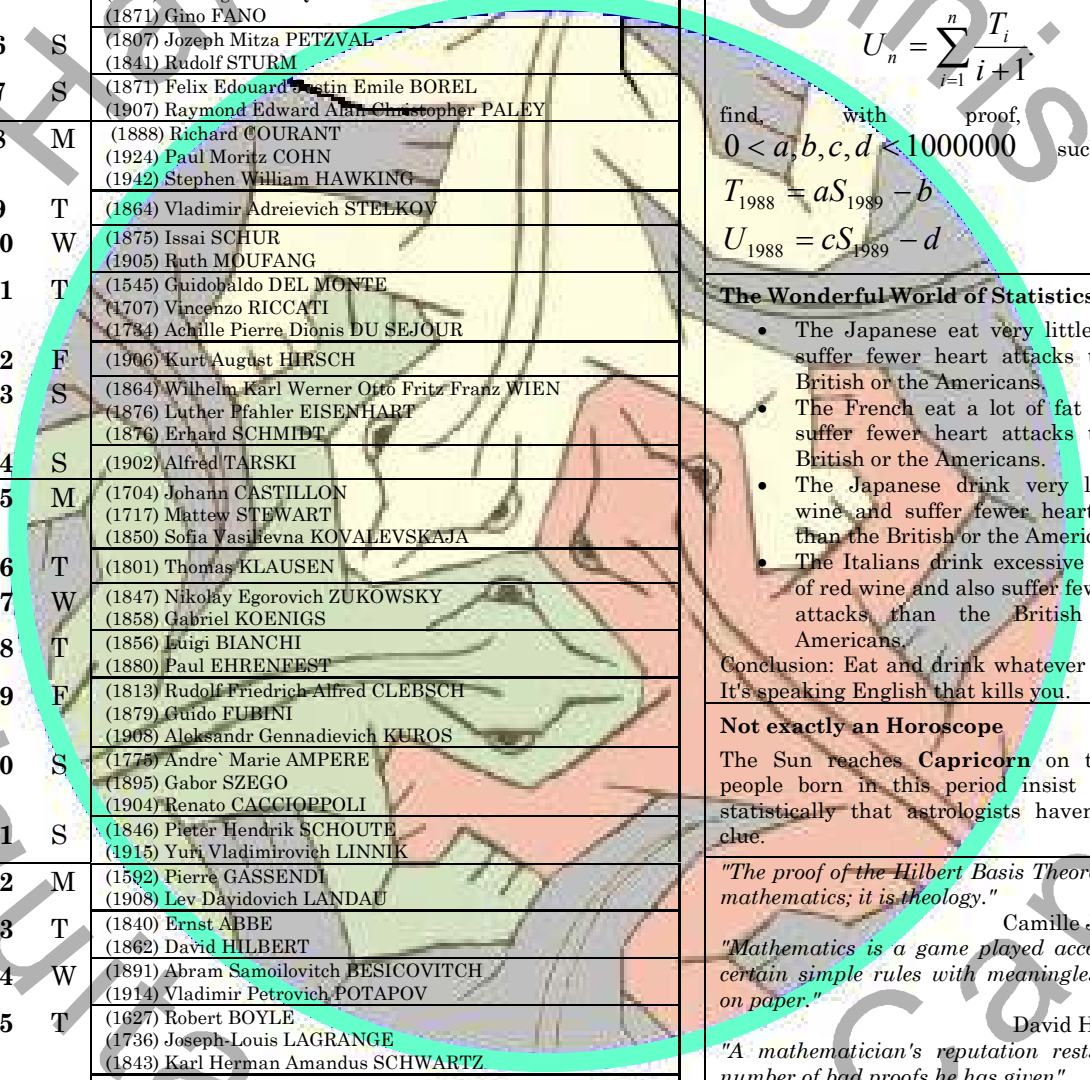






January

1	**1**	M	(1803) Guglielmo LIBRI Carucci dalla Sommaja (1878) Agner Krarup ERLANG (1894) Satyendranath BOSE (1912) Boris GNEDENKO
	2	T	(1822) Rudolf Julius Emmanuel CLAUSIUS (1905) Lev Genrichovich SHNIRELMAN (1938) Anatoly SAMOILENKO
	3	W	(1917) Yuri Alexeievich MITROPOLSHY
	4	T	(1643) Isaac NEWTON
	5	F	(1838) Marie Ennemond Camille JORDAN (1871) Federigo ENRIQUES (1871) Gino FANO
	6	S	(1807) Jozeph Mitza PETZVAL (1841) Rudolf STURM
	7	S	(1871) Felix Edouard Justin Emile BOREL (1907) Raymond Edward Alan Christopher PALEY
2	**8**	M	(1888) Richard COURANT (1924) Paul Moritz COHN (1942) Stephen William HAWKING
	9	T	(1864) Vladimir Adreievich STELKOV
	10	W	(1875) Issai SCHUR (1905) Ruth MOUFANG
	11	T	(1545) Guidobaldo DEL MONTE (1707) Vincenzo RICCATI (1734) Achille Pierre Dionis DU SEJOUR
	12	F	(1906) Kurt August HIRSCH
	13	S	(1864) Wilhelm Karl Werner Otto Fritz Franz WIEN (1876) Luther Pfahler EISENHART (1876) Erhard SCHMIDT
	14	S	(1902) Alfred TARSKI
3	**15**	M	(1704) Johann CASTILLON (1717) Mattew STEWART (1850) Sofia Vasilievna KOVALEVSKAJA
	16	T	(1801) Thomas KLAUSEN
	17	W	(1847) Nikolay Egorovich ZUKOWSKY (1858) Gabriel KOENIGS
	18	T	(1856) Luigi BIANCHI (1880) Paul EHRENFEST
	19	F	(1813) Rudolf Friedrich Alfred CLEBSCH (1879) Guido FUBINI (1908) Aleksandr Gennadievich KUROS
	20	S	(1775) Andre` Marie AMPERE (1895) Gabor SZEGO (1904) Renato CACCIOPPOLI
	21	S	(1846) Pieter Hendrik SCHOUTE (1915) Yuri Vladimirovich LINNIK
4	**22**	M	(1592) Pierre GASSENDI (1908) Lev Davidovich LANDAU
	23	T	(1840) Ernst ABBE (1862) David HILBERT
	24	W	(1891) Abram Samoilovitch BESICOVITCH (1914) Vladimir Petrovich POTAPOV
	25	T	(1627) Robert BOYLE (1736) Joseph-Louis LAGRANGE (1843) Karl Herman Amandus SCHWARTZ
	26	F	(1799) Benoit Paul Emile CLAPEYRON
	27	S	(1832) Charles Lutwidge DODGSON
	28	S	(1701) Charles Marie de LA CONDAMINE (1892) Carlo Emilio BONFERRONI
5	**29**	M	(1817) William FERREL (1888) Sidney CHAPMAN
	30	T	(1619) Michelangelo RICCI
	31	W	(1715) Giovanni Francesco FAGNANO dei Toschi (1841) Samuel LOYD (1896) Sofia Alexandrovna JANOWSKAJA



18th USAMO – 1989

For each positive integer n, let

$$S_n = \sum_{i=1}^{n} \frac{1}{i};$$

$$T_n = \sum_{i=1}^{n} S_i;$$

$$U_n = \sum_{i=1}^{n} \frac{T_i}{i+1}.$$

find, with proof, integers $0 < a, b, c, d < 1000000$ such that $T_{1988} = aS_{1989} - b$ and $U_{1988} = cS_{1989} - d$

The Wonderful World of Statistics

- The Japanese eat very little fat and suffer fewer heart attacks than the British or the Americans.
- The French eat a lot of fat and also suffer fewer heart attacks than the British or the Americans.
- The Japanese drink very little red wine and suffer fewer heart attacks than the British or the Americans.
- The Italians drink excessive amounts of red wine and also suffer fewer heart attacks than the British or the Americans.

Conclusion: Eat and drink whatever you like. It's speaking English that kills you.

Not exactly an Horoscope

The Sun reaches **Capricorn** on the 21st; people born in this period insist to prove statistically that astrologists haven't got a clue.

"The proof of the Hilbert Basis Theorem is not mathematics; it is theology."

Camille JORDAN

"Mathematics is a game played according to certain simple rules with meaningless marks on paper."

David HILBERT

"A mathematician's reputation rests on the number of bad proofs he has given"

Abram BESICOVITCH

February

5	1	T	(1900) John Charles BURKILL
	2	F	(1522) Lodovico FERRARI
	3	S	(1893) Gaston Maurice JULIA
	4	S	(1905) Eric Cristopher ZEEMAN
6	5	M	(1757) Jean Marie Constant DUHAMEL
	6	T	(1612) Antoine ARNAULD (1695) Nicolaus (II) BERNOULLI
	7	W	(1877) Godfried Harold HARDY (1883) Eric Temple BELL
	8	T	(1700) Daniel BERNOULLI (1875) Francis Ysidro EDGEWORTH
	9	F	(1775) Farkas Wolfgang BOLYAI (1907) Harod Scott MacDonald COXETER
	10	S	(1747) Aida YASUAKI
	11	S	(1800) William Henry Fox TALBOT (1839) Josiah Willard GIBBS (1915) Richard Wesley HAMMING
7	12	M	(1914) Hanna CAEMMERER NEUMANN
	13	T	(1805) Johann Peter Gustav Lejeune DIRICHLET
	14	W	(1468) Johann WERNER (1849) Hermann HANKEL (1896) Edward Artur MILNE
	15	T	(1564) Galileo GALILEI (1861) Alfred North WHITEHEAD (1946) Douglas HOFSTADTER
	16	F	(1822) Francis GALTON (1853) Georgorio RICCI-CURBASTRO (1903) Beniamino SEGRE
	17	S	(1890) Sir Ronald Aymler FISHER (1891) Adolf Abraham Halevi FRAENKEL
	18	S	(1404) Leon Battista ALBERTI
8	19	M	(1473) Nicolaus COPERNICUS
	20	T	(1844) Ludwig BOLTZMANN
	21	W	(1591) Girard DESARGUES (1915) Evgenni Michailovitch LIFSHITZ
	22	T	(1903) Frank Plumpton RAMSEY
	23	F	(1583) Jean-Baptiste MORIN (1951) Shigefumi MORI
	24	S	(1871) Felix BERNSTEIN
	25	S	(1827) Henry WATSON
9	26	M	(1786) Dominique Francois Jean ARAGO
	27	T	(1881) Luitzen Egbertus Jan BROUWER
	28	W	(1735) Alexandre Theophile VANDERMONDE
			(1860) Herman HOLLERITH

18th USAMO – 1989

The 20 members of a local tennis club have scheduled exactly 14 two-person games among themselves, with each member playing in at least one game. Prove that within this schedule there must be a set of 6 games with 12 distinct players.

The Wonderful World of Statistics

Anytime you have a 50-50 chance of getting something right, there's a 90% probability you'll get it wrong.

Not exactly an Horoscope

The Sun reaches **Aquarius** on the 16th; people born in this period are convinced that astrologists persecute them only.

"Common sense is not really so common"

Antoine ARNAUD

"Archimedes will be remembered when Aeschylus is forgotten, because languages die and mathematical ideas do not. "Immortality" may be a silly word, but probably a mathematician has the best chance of whatever it may mean."

Godfried HARDY

"it would be better for the true physics if there were no mathematicians on earth"

Daniel BERNOULLI

"Epur si muove"

Galileo GALILEI

"Euler calculated without effort, just as men breathe, as eagles sustain themselves in the air"

Dominique ARAGO

One of the principle objects of research in my department of knowledge is to find the point of view from which the subject appears in the greatest simplicity.

Willard GIBBS

Whenever you can, count.

Francis GALTON

March

9	**1**	T	(1611) John PELL
	2	F	(1836) Julius WEINGARTEN
	3	S	(1838) George William HILL (1845) Georg CANTOR
	4	S	(1822) Jules Antoine LISSAJUS
10	**5**	M	(1512) Gerardus MERCATOR (1759) Benjamin GOMPERTZ (1817) Angelo GENOCCHI
	6	T	(1866) Ettore BORTOLOTTI
	7	W	(1792) William HERSCHEL (1824) Delfino CODAZZI
	8	T	(1851) George CHRYSTAL
	9	F	(1818) Ferdinand JOACHIMSTHAL (1900) Howard Hathaway AIKEN
	10	S	(1864) William Fogg OSGOOD
	11	S	(1811) Urbain Jean Joseph LE VERRIER (1853) Salvatore PINCHERLE
11	**12**	M	(1685) George BERKELEY (1824) Gustav Robert KIRKHHOFF (1859) Ernesto CESARO
	13	T	(1861) Jules Joseph DRACH (1957) Rudy D'ALEMBERT
	14	W	(1864) Jozef KURSCHAK (1879) Albert EINSTEIN
	15	T	(1860) Walter Frank Raphael WELDON (1868) Grace CHISOLM YOUNG
	16	F	(1750) Caroline HERSCHEL (1789) Georg Simon OHM (1846) Magnus Gosta MITTAG-LEFFLER
	17	S	(1876) Ernest Benjamin ESCLANGON (1897) Charles FOX
	18	S	(1640) Philippe de LA HIRE (1690) Christian GOLDBACH (1796) Jacob STEINER
12	**19**	M	(1862) Adolf KNESER (1910) Jacob WOLFOWITZ
	20	T	(1840) Franz MERTENS (1884) Philip FRANCK (1938) Sergei Petrovich NOVIKOV
	21	W	(1768) Jean Baptiste Joseph FOURIER (1884) George David BIRKHOFF
	22	T	(1917) Irving KAPLANSKY
	23	F	(1754) Georg Freiherr von VEGA (1882) Emmy Amalie NOETHER (1897) John Lighton SYNGE
	24	S	(1809) Joseph LIOUVILLE (1948) Sun-Yung (Alice) CHANG
	25	S	(1538) Christopher CLAUSIUS
13	**26**	M	(1848) Konstantin ADREEV (1913) Paul ERDOS
	27	T	(1857) Karl PEARSON
	28	W	(1749) Pierre Simon de LAPLACE
	29	T	(1825) Francesco FAA` DI BRUNO (1873) Tullio LEVI-CIVITA (1896) Wilhelm ACKERMAN
	30	F	(1892) Stefan BANACH
	31	S	(1596) Rene` DESCARTES

18th USAMO – 1989

Let $P(z) = z^n + c_1 z^{n-1} + \ldots + c_n$ be a polynomial in the complex variable z, with real coefficients c_k. Suppose that $|P(i)| < 1$.

Prove that there exist real numbers a and b such that $P(a+bi) = 0$ and $(a^2+b^2+1)^2 < 4b^2+1$.

The Wonderful World of Statistics

The latest survey shows that 3 out of 4 people make up 75% of the world's population.

Not exactly an Horoscope

The Sun reaches **Pisces** on the 12th; people born in this period let the astrologists talk for three hours and then interrupt with "Sorry? I got distracted".

"And what are these fluxions? The velocities of evanescent increments? They are neither finite quantities, nor quantities infinitely small, nor yet nothing. May we not call them ghosts of departed quantities?"

George BERKELEY

"Common sense is nothing more than a deposit of prejudices laid down in the mind before you reach eighteen."

Albert EINSTEIN

"We [he and Halmos] *share a philosophy about linear algebra: we think basis-free, we write basis-free, but when the chips are down we close the office door and compute with matrices like fury."*

Irving KAPLANSKY

"A Mathematician is a machine for turning coffee into theorems."

Paul ERDOS

"What we know is not much. What we do not know is immense."

Pierre Simon de LAPLACE

April

13	**1**	S	(1640) Georg MOHR (1776) Marie-Sophie GERMAIN (1895) Alexander Craig AITKEN
14	**2**	M	(1934) Paul Joseph COHEN
	3	T	(1835) John Howard Van AMRINGE (1892) Hans RADEMACHER (1900) Albert Edward INGHAM (1909) Stanislaw Marcin ULAM (1971) Alice RIDDLE
	4	W	(1809) Benjamin PEIRCE (1842) Francois Edouard Anatole LUCAS (1949) Shing-Tung YAU
	5	T	(1588) Thomas HOBBES (1607) Honore` FABRI (1622) Vincenzo VIVIANI (1869) Sergi Alexeievich CHAPLYGIN
	6	F	
	7	S	(1768) Francais Joseph FRANCAIS
	8	S	(1903) Marshall Harvey STONE
15	**9**	M	(1791) George PEACOCK (1816) Charles Eugene DELAUNAY (1919) John Presper HECKERT
	10	T	(1857) Henry Ernest DUDENEY
	11	W	(1953) Andrew John WILES
	12	T	(1794) Germinal Pierre DANDELIN (1852) Carl Louis Ferdinand Von LINDEMANN (1903) Jan TINBERGEN
	13	F	(1728) Paolo FRISI (1813) Duncan Farquharson GREGORY (1879) Francesco SEVERI
	14	S	(1629) Christiaan HUYGENS
	15	S	(1452) Leonardo da VINCI (1548) Pietro Antonio CATALDI (1707) Leonhard EULER (1809) Herman Gunther GRASSMANN
16	**16**	M	(1682) John HADLEY (1823) Ferdinand Gotthold Max EISENSTEIN
	17	T	(1798) Etienne BOBILLIER (1853) Arthur Moritz SCHONFLIES
	18	W	(1907) Lars Valerian AHLFORS (1918) Hsien Chung WANG (1949) Charles Luois FEFFERMAN
	19	T	(1880) Evgeny Evgenievich SLUTSKY (1883) Richard VIN MISES (1901) Kiyoshi OKA (1905) Charles EHRESMANN
	20	F	(1839) Francesco SIACCI
	21	S	(1652) Michel ROLLE (1774) Jean Baptiste BIOT (1875) Teiji TAKAGI
	22	S	(1811) Otto Ludwig HESSE (1887) Harald August BOHR
17	**23**	M	(1858) Max Karl Ernst Ludwig PLANCK
	24	T	(1863) Giovanni VAILATI
	25	W	(1849) Felix Christian KLEIN (1900) Wolfgang PAULI (1903) Andrei Nicolayevich KOLMOGOROV
	26	T	(1889) Ludwig Josef Johan WITTENGSTEIN
	27	F	(1755) Marc-Antoine PARSEVAL des Chenes
	28	S	(1906) Kurt GODEL
	29	S	(1854) Jules Henri POINCARE`
18	**30**	M	(1777) Johann Carl Friedrich GAUSS (1916) Claude Elwood SHANNON

18th USAMO – 1989

Let ABC be an acute-angled triangle whose side lengths satisfy the inequalities $AB < BC < AC$. If point I is the center of the inscribed circle circle of triangle ABC and point O is the center of the circumscribed circle, prove that line IO intersects segments AB and BC.

The Wonderful World of Statistics

A couple of months in the laboratory can frequently save a couple of hours in the library.

Not exactly an Horoscope

The Sun reaches **Aries** on the 18th; people born under this sign try all the time to convince the astrologists they are wrong, but, unlike Capricorns, it normally ends up badly.

I will stop here.

Andrew WILES

"The notion of a set is too vague for the continuum hypothesis to have a positive or negative answer."

Paul Joseph COHEN

"Knowing what is big and what is small is more important than being able to solve partial differential equations"

Stanislaw Marcin ULAM

"You treat world history as a mathematician does mathematics, in which nothing but laws and formulae exist, no reality, no good and evil, no time, no yesterday, no tomorrow, nothing but an eternal shallow, mathematical present."

Otto Ludwig HESSE

"An important scientific innovation rarely makes its way by gradually winning over and converting its opponents: it rarely happens that Saul becomes Paul. What does happen is that its opponents gradually die out, and that the growing generation is familiarised with the ideas from the beginning"

Max Karl Ernst Ludwig PLANCK

"Everyone knows what a curve is, until he has studied enough mathematics to become confused through the countless number of possible exceptions."

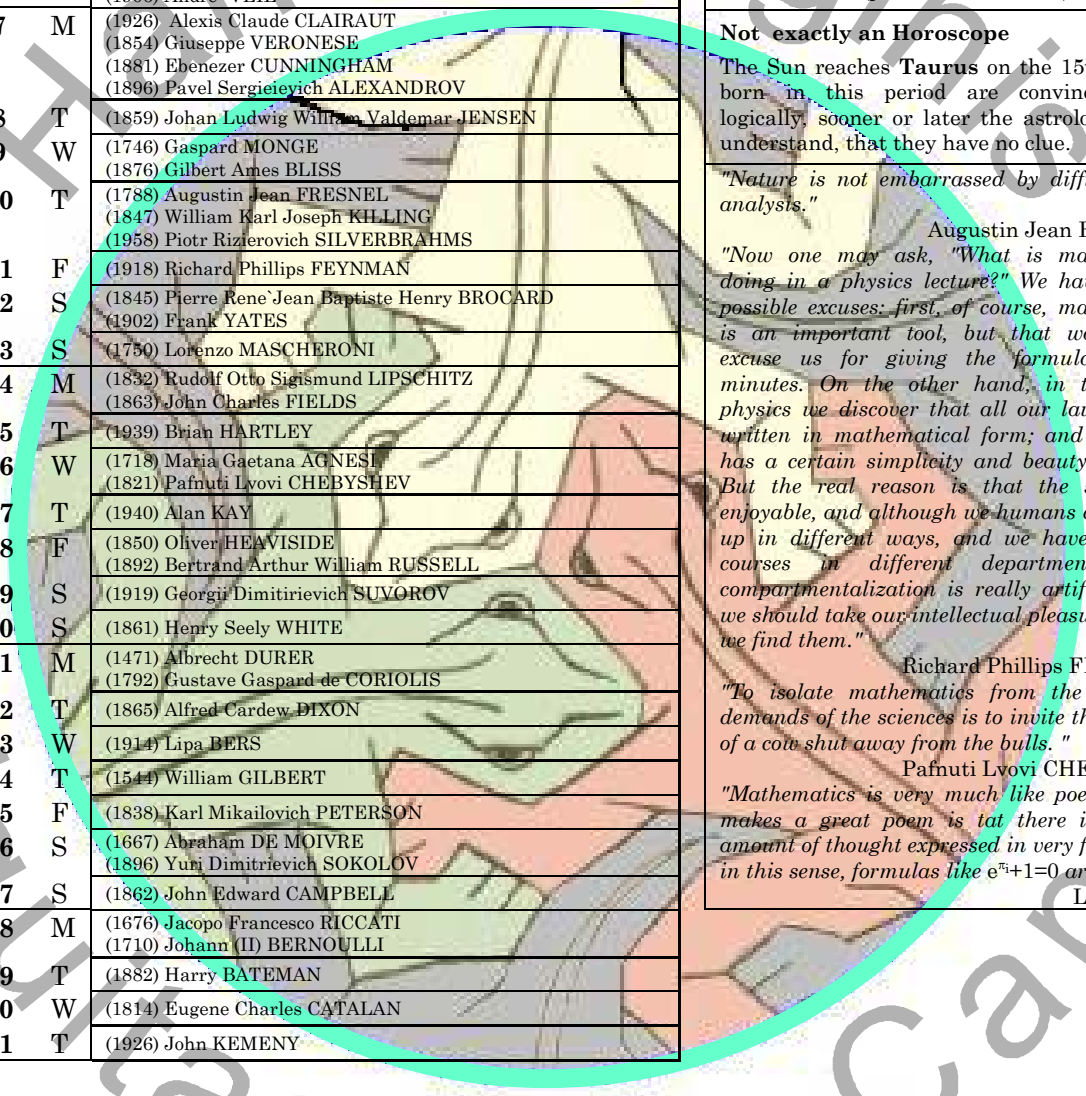
Felix KLEIN

" The fact that the author thinks slowly is not serious, but the fact that he publishes faster than he thinks is inexcusable."

Wolfgang PAULI

May

18	**1**	T	(1825) Johann Jacob BALMER
	2	W	(1860) D`Arcy Wentworth THOMPSON (1905) Kazimierz ZARANKIEWITZ
	3	T	(1842) Otto STOLZ (1860) Vito VOLTERRA
	4	F	(1845) William Kingdon CLIFFORD
	5	S	(1833) Lazarus Emmanuel FUCHS (1897) Francesco Giacomo TRICOMI
	6	S	(1872) Willem DE SITTER (1906) Andre` VEIL
19	**7**	M	(1926) Alexis Claude CLAIRAUT (1854) Giuseppe VERONESE (1881) Ebenezer CUNNINGHAM (1896) Pavel Sergeievich ALEXANDROV
	8	T	(1859) Johan Ludwig William Valdemar JENSEN
	9	W	(1746) Gaspard MONGE (1876) Gilbert Ames BLISS
	10	T	(1788) Augustin Jean FRESNEL (1847) William Karl Joseph KILLING (1958) Piotr Rizierovich SILVERBRAHMS
	11	F	(1918) Richard Phillips FEYNMAN
	12	S	(1845) Pierre Rene`Jean Baptiste Henry BROCARD (1902) Frank YATES
	13	S	(1750) Lorenzo MASCHERONI
20	**14**	M	(1832) Rudolf Otto Sigismund LIPSCHITZ (1863) John Charles FIELDS
	15	T	(1939) Brian HARTLEY
	16	W	(1718) Maria Gaetana AGNESI (1821) Pafnuti Lvovi CHEBYSHEV
	17	T	(1940) Alan KAY
	18	F	(1850) Oliver HEAVISIDE (1892) Bertrand Arthur William RUSSELL
	19	S	(1919) Georgii Dimitirievich SUVOROV
	20	S	(1861) Henry Seely WHITE
21	**21**	M	(1471) Albrecht DURER (1792) Gustave Gaspard de CORIOLIS
	22	T	(1865) Alfred Cardew DIXON
	23	W	(1914) Lipa BERS
	24	T	(1544) William GILBERT
	25	F	(1838) Karl Mikailovich PETERSON
	26	S	(1667) Abraham DE MOIVRE (1896) Yuri Dimitrievich SOKOLOV
	27	S	(1862) John Edward CAMPBELL
22	**28**	M	(1676) Jacopo Francesco RICCATI (1710) Johann (II) BERNOULLI
	29	T	(1882) Harry BATEMAN
	30	W	(1814) Eugene Charles CATALAN
	31	T	(1926) John KEMENY



25th USAMO – 1996

Prove that the average of the numbers $n \sin n$ is $\cot 1$ (angles in degrees)

The Wonderful World of Statistics

How many statisticians does it take to change a light bulb?

One (plus or minus three)

Not exactly an Horoscope

The Sun reaches **Taurus** on the 15th; people born in this period are convinced that, logically, sooner or later the astrologists will understand, that they have no clue.

"Nature is not embarrassed by difficulties of analysis."

Augustin Jean FRESNEL

"Now one may ask, "What is mathematics doing in a physics lecture?" We have several possible excuses: first, of course, mathematics is an important tool, but that would only excuse us for giving the formula in two minutes. On the other hand, in theoretical physics we discover that all our laws can be written in mathematical form; and that this has a certain simplicity and beauty about it. But the real reason is that the subject is enjoyable, and although we humans cut nature up in different ways, and we have different courses in different departments, such compartmentalization is really artificial, and we should take our intellectual pleasures where we find them."

Richard Phillips FEYNMAN

"To isolate mathematics from the practical demands of the sciences is to invite the sterility of a cow shut away from the bulls. "

Pafnuti Lvovi CHEBYSHEV

"Mathematics is very much like poetry. What makes a great poem is tat there is a great amount of thought expressed in very few words. in this sense, formulas like $e^{\pi i}+1=0$ are poems.

Lipa BERS

June

22	**1**	F	(1796) Sadi Leonard Nicolas CARNOT (1851) Edward Bailey ELLIOTT (1899) Edward Charles TITCHMARSH
	2	S	(1895) Tibor RADO`
	3	S	(1659) David GREGORY
23	**4**	M	(1809) John Henry PRATT
	5	T	(1814) Pierre LAurent WANTZEL (1819) John Couch ADAMS
	6	W	(1436) Johann Muller REGIOMONTANUS (1857) Aleksandr Michailovitch LYAPUNOV (1906) Max ZORN
	7	T	(1863) Edward Burr VAN VLECK
	8	F	(1625) Giovanni Domenico CASSINI (1858) Charlotte Angas SCOTT (1860) Alicia Boole STOTT
	9	S	(1885) John Edensor LITTLEWOOD
	10	S	(940) Mohammad ABU`L WAFA Al-Buzjani (1887) Vladimir Ivanovich SMIRNOV
24	**11**	M	(1937) David Bryant MUMFORD
	12	T	(1888) Zygmunt JANYSZEWSKI
	13	W	(1831) James Clerk MAXWELL (1876) William Sealey GOSSET (Student) (1928) John Forbes NASH
	14	T	(1736) Charles Augustin de COULOMB (1856) Andrei Andreyevich MARKOV (1903) Alonzo CHURCH
	15	F	(1640) Bernard LAMY (1894) Nikolai Gregorievich CHEBOTARYOV
	16	S	(1915) John Wilder TUKEY
	17	S	(1898) Maurits Cornelius ESCHER
25	**18**	M	(1858) Andrew Russell FORSYTH (1884) Charles Ernest WEATHERBURN
	19	T	(1623) Blaise PASCAL (1902) Wallace John ECKERT
	20	W	(1873) Alfred LOEWY
	21	T	(1781) Simeon Denis POISSON (1828) Giuseppe BRUNO
	22	F	(1823) Mario PIERI (1864) Hermann MINKOWSKY (1910) Konrad ZUSE
	23	S	(1912) Alan Mathison TURING
	24	S	(1880) Oswald VEBLEN
26	**25**	M	(1908) William Van Orman QUINE
	26	T	(1824) William THOMSON, Lord Kelvin (1918) Yudell Leo LUKE
	27	W	(1806) Augustus DE MORGAN
	28	T	(1875) Henri Leon LEBESGUE
	29	F	(1888) Aleksandr Aleksandrovich FRIEDMANN
	30	S	(1791) Félix SAVART

25th USAMO – 1996

For any nonempty set S of real numbers, let $\sigma(s)$ denote the sum of the elements of S. Given a set A of n positive integers, consider the collection of all distinct sums $\sigma(S)$ as S ranges over the nonempty subsets of A. Prove that this collection of sums can be partitioned into n classes so that in each class, the ratio of the largest sum to the smallest sum does not exceed 2.

The Wonderful World of Statistics

A statistician is an accountant without the charisma.

Not exactly an Horoscope

The Sun reaches **Gemini** on the 21st; people born under this sign tend to ask the astrologists who was born first, the tramp or the gentleman.

Do not imagine that mathematics is hard and crabbed, and repulsive to common sense. It is merely the etherialization of common sense.

William THOMSON (Lord Kelvin)

The mathematical education of the young physicist [Albert Einstein] was not very solid, which I am in a good position to evaluate since he obtained it from me in Zurich some time ago.

Hermann MINKOWSY

"It can be of no practical use to know that π is irrational, but if we can know, it surely would be intolerable not to know".

Edward Charles TICHMARSH

"What I give form to in daylight is only one per cent of what I have seen in darkness"

Maurits Cornelius ESCHER

"The more I see of men, the better I like my dog"

Blaise PASCAL

"Science is a differential equation. Religion is a boundary condition"

Alan Mathison TURING

"In my opinion, a mathematician, in so far as he is a mathematician, need not preoccupy himself with philosophy -- an opinion, moreover, which has been expressed by many philosophers."

Henri LEBESGUE

July

26	**1**	S	(1643) Gottfried Wilhelm von LEIBNIZ (1788) Jean Victor PONCELET
27	**2**	M	(1820) William John Racquorn RANKINE (1852) William BURNSIDE
	3	T	(1807) Ernest Jean Philippe Fauque de JONQUIERE (1897) Jesse DOUGLAS
	4	W	(1906) Daniel Edwin RUTHERFORD (1917) Michail Samuilovich LIVSIC
	5	T	(1936) James MIRRLEES
	6	F	(1849) Alfred Bray KEMPE
	7	S	(1816) Johann Rudolf WOLF (1906) William FELLER (1922) Vladimir Aleksandrovich MARCHENKO
	8	S	(1760) Christian KRAMP
28	**9**	M	(1845) George Howard DARWIN
	10	T	(1862) Roger COTES (1868) Oliver Dimon KELLOGG
	11	W	(1857) Sir Joseph LARMOR (1890) Giacomo ALBANESE
	12	T	(1875) Ernest Sigismund FISCHER (1895) Richard BUCKMINSTER FULLER
	13	F	(1527) John DEE (1741) Karl Friedrich HINDENBURG
	14	S	
	15	S	(1865) Wilhelm WIRTINGER (1906) Adolph Andrej Pavlovich YUSHKEVICH
29	**16**	M	(1678) Jakob HERMANN (1903) Irmgard FLUGGE-LOTZ
	17	T	(1831) Victor Mayer Amedee` MANNHEIM (1837) Wilhelm LEXIS
	18	W	(1013) Hermann von REICHENAU (1635) Robert HOOKE (1853) Hendrich Antoon LORENTZ
	19	T	(1768) Francois Joseph SERVOIS
	20	F	
	21	S	(1620) Jean PICARD (1848) Emil WEYR (1849) Robert Simpson WOODWARD
	22	S	(1784) Friedrich Wilhelm BESSEL
30	**23**	M	(1775) Etienne Louis MALUS (1854) Ivan SLEZYNSKY
	24	T	(1851) Friedrich Herman SCHOTTKY (1871) Paul EPSTEIN (1923) Christine Mary HAMILL
	25	W	(1808) Johann Benedict LISTING
	26	T	(1903) Kurt MAHLER
	27	F	(1667) Johann BERNOULLI (1801) George Biddel AIRY (1848) Lorand Baron von EOTVOS (1871) Ernst Friedrich Ferdinand ZERMELO
	28	S	(1954) Gerd FALTINGS
	29	S	(1898) Isidor Isaac RABI
31	**30**	M	(1889) Vladimir Kosma ZWORKYN
	31	T	(1704) Gabriel CRAMER (1712) Johann Samuel KOENIG

25th USAMO – 1996

Let ABC be a triangle. prove that there is s line ℓ (in the plane of the triangle ABC) such that the intersection of the interior of the triangle ABC and the interior of its reflection $A'B'C'$ in ℓ has area more than $2/3$ the area of the triangle ABC.

The Wonderful World of Statistics

Theory and practice are the same in theory. In practice they are different

Not exactly an Horoscope

The Sun reaches **Cancer** on the 20th; people born in this period let the astrologists talk for three hours, then reply "No", and leave them to pay the bill.

"When working on a problem, I never think about beauty; I think only of how to solve the problem. But when I have finished, if the solution is not beautiful, I know that it is wrong."

Richard Buckminster FULLER

" There is (gentle reader) nothing (the works of God only set apart) which so much beautifies and adorns the soul and mind of man as does knowledge of the good arts and sciences. ... Many ... arts there are which beautify the mind of man; but of all none do more garnish and beautify it than those arts which are called mathematical, unto the knowledge of which no man can attain, without perfect knowledge and instruction of the principles, grounds, and Elements of Geometry."

John DEE

"CEIIOSSOTTUU"

Anagram to establish priority in the discovery of elasticity: "*Ut tensio, sic uis*"

Robert HOOKE

"[The infinitesimals] neither have nor can have theory; in practise it is a dangerous instrument in the hands of beginners ... anticipating, for my part, the judgement of posterity, I would predict that this method will be accused one day, and rightly, of having retarded the progress of the mathematical sciences. "

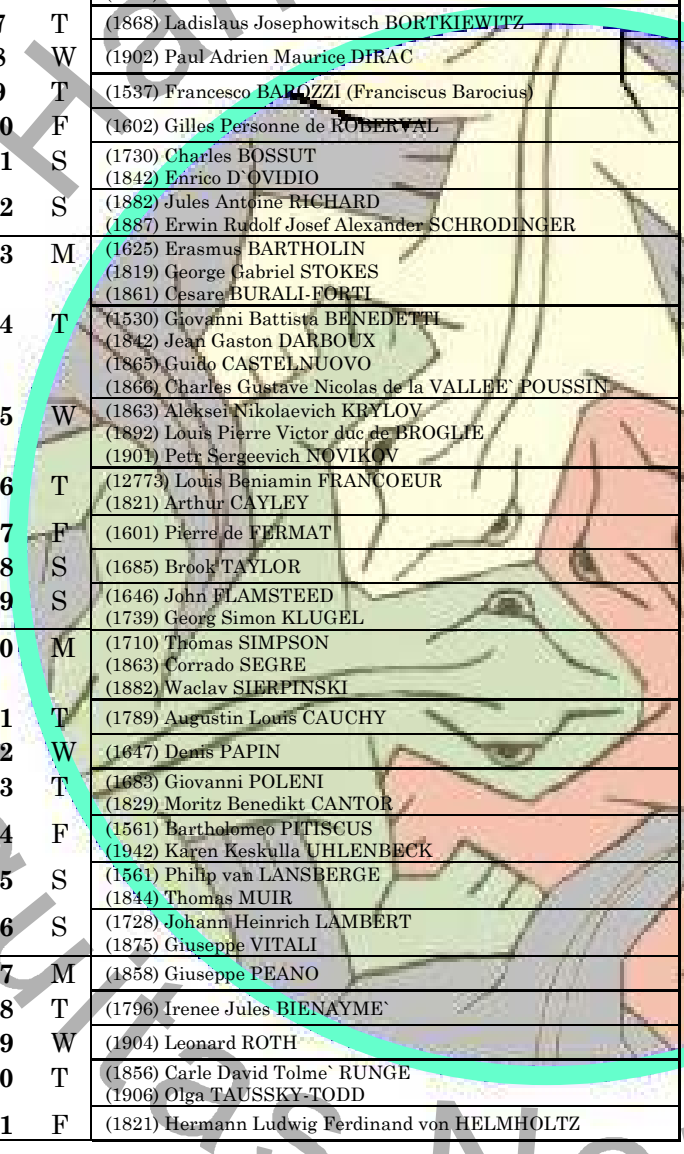
Francois Joseph SERVOIS

"A quantity which is increased or decreased by an infinitely small quantity is neither increased nor decreased."

Johann BERNOULLI

August

31	**1**	W	(1861) Ivar Otto BENDIXSON (1881) Otto TOEPLITZ
	2	T	(1856) Ferdinand RUDIO (1902) Mina Spiegel REES
	3	F	(1914) Mark KAC
	4	S	(1805) Sir William Rowan HAMILTON (1838) John VENN
	5	S	(1802) Niels Henrik ABEL
32	**6**	M	(1638) Nicolas MALEBRANCHE (1741) John WILSON
	7	T	(1868) Ladislaus Josephowitsch BORTKIEWITZ
	8	W	(1902) Paul Adrien Maurice DIRAC
	9	T	(1537) Francesco BAROZZI (Franciscus Barocius)
	10	F	(1602) Gilles Personne de ROBERVAL
	11	S	(1730) Charles BOSSUT (1842) Enrico D`OVIDIO
	12	S	(1882) Jules Antoine RICHARD (1887) Erwin Rudolf Josef Alexander SCHRODINGER
33	**13**	M	(1625) Erasmus BARTHOLIN (1819) George Gabriel STOKES (1861) Cesare BURALI-FORTI
	14	T	(1530) Giovanni Battista BENEDETTI (1842) Jean Gaston DARBOUX (1865) Guido CASTELNUOVO (1866) Charles Gustave Nicolas de la VALLEE` POUSSIN
	15	W	(1863) Alekseĭ Nikolaevich KRYLOV (1892) Louis Pierre Victor duc de BROGLIE (1901) Petr Sergeevich NOVIKOV
	16	T	(12773) Louis Beniamin FRANCOEUR (1821) Arthur CAYLEY
	17	F	(1601) Pierre de FERMAT
	18	S	(1685) Brook TAYLOR
	19	S	(1646) John FLAMSTEED (1739) Georg Simon KLUGEL
34	**20**	M	(1710) Thomas SIMPSON (1863) Corrado SEGRE (1882) Waclav SIERPINSKI
	21	T	(1789) Augustin Louis CAUCHY
	22	W	(1647) Denis PAPIN
	23	T	(1683) Giovanni POLENI (1829) Moritz Benedikt CANTOR
	24	F	(1561) Bartholomeo PITISCUS (1942) Karen Keskulla UHLENBECK
	25	S	(1561) Philip van LANSBERGE (1844) Thomas MUIR
	26	S	(1728) Johann Heinrich LAMBERT (1875) Giuseppe VITALI
35	**27**	M	(1858) Giuseppe PEANO
	28	T	(1796) Irenee Jules BIENAYME`
	29	W	(1904) Leonard ROTH
	30	T	(1856) Carle David Tolme` RUNGE (1906) Olga TAUSSKY-TODD
	31	F	(1821) Hermann Ludwig Ferdinand von HELMHOLTZ



25th USAMO – 1996

An $n-$term sequence $(x_1, x_2, \ldots, x_n)$ in which each term is either 0 or 1 is called a *binary sequence of length* n. Let a_n the number of binary sequences of length n containing no three consecutive terms equal to $0,1,0$ in that order. Let b_n the number of binary sequences of length n that contain no four consecutive terms equal to $0,0,1,1$ or $1,1,0,0$ in that order. Prove that $b_{n+1} = 2a_n$ for all positive integers n.

The Wonderful World of Statistics

Every day, innumeracy affects 8 out of 5 people

Not exactly an Horoscope

The Sun reaches **Leo** on the 11th; people born in this period are proud of having never read a horoscope with a good guess.

Thus, the task is, not so much to see what no one has yet seen; but to think what nobody has yet thought, about that which everybody sees

Erwin SCHROEDINGER

The whole form of mathematical thinking was created by Euler. It is only with the greatest of difficulty that one is able to follow the writings of any author preceding Euler, because it was not yet known how to let the formulas speak for themselves. This art Euler was the first to teach.

Edward RUDIO

"There are surely worse things than being wrong, and being dull and pedantic are surely among them."

Mark KAC

"This result is too beautiful to be false; it is more important to have beauty in one's equations than to have them fit experiment."

Paul Adrien Maurice DIRAC

"And perhaps, posterity will thank me for having shown it that the ancients did not know everything."

Pierre de FERMAT

"Cubum autem in duos cubos, aut quadratoquadratum in duos quadratoquadratos, et generaliter nullam in infinitum ultra quadratum potestatem in duos ejusdem nominis fas est dividere: cujus rei demonstrationem mirabilem sane detexi. Hanc marginis exiguitas non caperet"

Pierre de FERMAT

"Newton is, of course, the greatest of all Cambridge professors; he also happens to be the greatest disaster that ever befell not merely Cambridge mathematics in particular, but British mathematical science as a whole"

Leonard ROTH

September

35	**1**	S	(1659) Joseph SAURIN (1835) William Stankey JEVONS
	2	S	(1878) Mauriche Rene` FRECHET (1923) Rene` THOM
36	**3**	M	(1814) James Joseph SYLVESTER (1884) Solomon LEFSCHETZ (1908) Lev Semenovich PONTRYAGIN
	4	T	(1809) Luigi Federico MENABREA
	5	W	(1667) Giovanni Girolamo SACCHERI (1725) Jean Etienne MONTUCLA
	6	T	(1859) Boris Jakovlevich BUKREEV (1863) Dimitri Aleksandrovich GRAVE
	7	F	(1707) George Louis Leclerc comte de BUFFON (1955) Efim ZELMANOV
	8	S	(1584) Gregorius SAINT-VINCENT (1588) Marin MERSENNE
	9	S	(1860) Frank MORLEY
37	**10**	M	(1839) Charles Sanders PEIRCE
	11	T	(1623) Stefano degli ANGELI (1877) sir James Hopwood JEANS
	12	W	(1891) Antoine Andre` Louis REYNAUD (1900) Haskell Brooks CURRY
	13	T	(1873) Constantin CARATHEODORY (1885) Wilhelm Johann Eugen BLASCHKE
	14	F	(1858) Henry Burchard FINE (1891) Ivan Matveevich VINOGRADOV
	15	S	(973) Abu Arrayhan Muhammad ibn Ahmad AL BIRUNI (1886) Paul Pierre LEVY
	16	S	(1494) Francisco MAUROLICO (1736) Johann Nikolaus TETENS
38	**17**	M	(1743) Marie Jean Antoine Nicolas de Caritat de CONDORCET (1826) Georg Friedrich Bernhard RIEMANN
	18	T	(1752) Adrien Marie LEGENDRE
	19	W	(1749) Jean Baptiste DELAMBRE
	20	T	(1842) Alexander Wilhelm von BRILL (1861) Frank Nelson COLE
	21	F	(1899) Juliusz Pawel SCHAUDER
	22	S	(1765) Paolo RUFFINI (1769) Louis PUISSANT (1803) Jaques Charles Francois STURM
	23	S	(1768) William WALLACE (1900) David van DANTZIG
39	**24**	M	(1501) Girolamo CARDANO (1625) Johan DE WITT (1801) Michail Vasilevich OSTROGRADSKI
	25	T	(1819) George SALMON (1888) Stefan MAZURKIEWICZ
	26	W	(1688) Willem Jakob `s GRAVESANDE (1854) Percy Alexander MACMAHON (1891) Hans REICHENBACH
	27	T	(1855) Paul Emile APPEL (1876) Earle Raymond HEDRICK (1919) James Hardy WILKINSON
	28	F	(1698) Pierre Louis Moreau de MAUPERTUIS (1761) Ferdinand Francois Desire` Budan de BOISLAURENT (1873) Julian Lowell COOLIDGE
	29	S	(1561) Adriaan van ROOMEN (1812) Adolph GOPEL
	30	S	(1775) Robert ADRAIN (1829) Joseph WOLSTENHOLME (1883) Ernst HELLINGER

25th USAMO – 1996

Triangle ABC has the following property: there is an interior point P such that $\angle PAB = 10^\circ$, $\angle PBA = 20^\circ$, $\angle PCA = 30^\circ$ and $\angle PAC = 40^\circ$. Prove that triangle ABC is isosceles.

The Wonderful World of Statistics

Statistics means never having to say you're certain.

Not exactly an Horoscope

The Sun reaches **Virgo** on the 17th; people born under this sign claim they will listen to astrologists when they start working out the equinoxes precession.

I believe that proving is not a natural activity for mathematicians.

René THOM

Let us assume that the three dimensions of space are visualized in the customary fashion, and let us substitute a color for the fourth dimension. Every physical object is liable to changes in color as well as in position. An object might, for example, be capable of going through all shades from red through violet to blue. A physical reaction between any two bodies is possible only if they are close to each other in space as well as in color. Bodies of different colors would penetrate each other without interference ... If we lock a number of flies into a red glass globe, they may yet escape: they may change their color from red to blue and are then able to penetrate the red globe.

Hans REICHENBACH

"The importance of the "New Mathematics" lies mainly in the fact that it has taught us the difference between the disc and the circle."

Rene' THOM

"If it's just turning the crank it's algebra, but if it's got an idea in it, it's topology."

Solomon LEFSCHETZ

"This branch of mathematics [Probability] *is the only one, I believe, in which good writers frequently get results which are entirely erroneous."*

Charles Sanders PEIRCE

"We may as well cut out the group theory. That is a subject that will never be of any use in physics."

sir James Hopwood JEANS

"If error is corrected whenever it is recognised, the path of error is the path of truth."

Hans REICHENBACH

[Upon proving that the best betting strategy for "Gambler's Ruin" was to bet all on the first trial.]

"It is true that a man who does this is a fool. I have only proved that a man who does anything else is an even bigger fool."

Julian Lowell COOLIDGE

October

40	**1**	M	(1671) Luigi Guido GRANDI (1898) Bela KEREKJARTO`
	2	T	(1825) John James WALKER (1908) Arthur ERDELYI
	3	W	(1944) Pierre Rene` DELIGNE
	4	T	(1759) Louis Francois Antoine ARBOGAST (1797) Jerome SAVARY
	5	F	(1732) Nevil MASKELYNE (1781) Bernhard Placidus Johann Nepomuk BOLZANO (1861) Thomas Little HEATH
	6	S	(1552) Matteo RICCI (1831) Julius Wilhelm Richard DEDEKIND (1908) Sergei Lvovich SOBOLEV
	7	S	(1885) Niels BOHR
41	**8**	M	(1908) Hans Arnold HEILBRONN
	9	T	(1581) Claude Gaspard BACHET de Meziriac (1704) Johann Andrea von SEGNER (1873) Karl SCHWARTZSCHILD
	10	W	(1861) Heinrich Friedrich Karl Ludwig BURKHARDT
	11	T	(1675) Samuel CLARKE (1777) Barnabe` BRISSON (1885) Alfred HAAR (1910) Cahit ARF
	12	F	(1860) Elmer SPERRY
	13	S	(1890) Georg FEIGL (1893) Kurt Werner Friedrich REIDEMEISTER (1932) John Griggs THOMSON
	14	S	(1687) Robert SIMSON (1801) Joseph Antoine Ferdinand PLATEAU (1868) Alessandro PADOA
42	**15**	M	(1608) Evangelista TORRICELLI (1735) Jesse RAMSDEN (1776) Peter BARLOW
	16	T	(1879) Philip Edward Bertrand JOURDAIN
	17	W	(1759) Jacob (II) BERNOULLI (1888) Paul Isaac BERNAYS
	18	T	(1741) John WILSON
	19	F	(1903) Jean Frederic Auguste DELSARTE (1910) Subrahmanyan CHANDRASEKHAR
	20	S	(1632) Sir Cristopher WREN (1863) William Henry YOUNG (1865) Aleksandr Petrovich KOTELNIKOV
	21	S	(1677) Nicolaus (I) BERNOULLI (1823) Enrico BETTI (1855) Giovan Battista GUCCIA (1893) William LEonard FERRAR
43	**22**	M	(1587) Joachim JUNGIUS (1895) Rolf Herman NEVANLINNA (1907) Sarvadaman CHOWLA
	23	T	(1865) Piers BOHL
	24	W	(1804) Wilhelm Eduard WEBER (1873) Edmund Taylor WITTAKER
	25	T	(1811) Evariste GALOIS
	26	F	(1849) Ferdinand Georg FROBENIUS (1857) Charles Max MASON (1911) Shiing-Shen CHERN
	27	S	(1678) Pierre Remond de MONTMORT (1856) Ernest William HOBSON
	28	S	(1804) Pierre Francois VERHULST
44	**29**	M	(1925) Klaus ROTH
	30	T	(1906) Andrej Nikolaevich TIKHONOV
	31	W	(1815) Karl Theodor Wilhelm WEIERSTRASS

25th USAMO – 1996

Determine (with proof) whether there is a subset X of the integers with the following property: for any integer n there is exactly one solution of $a+2b=n$ with $a,b\in X$.

The Wonderful World of Statistics

If you want three opinions, just ask two statisticians.

Not exactly an Horoscope

The Sun reaches **Libra** on the 30th; people born in this period claim there should be more planets, which cannot but leave the astrologists quite perplexed.

"An expert is a man who has made all the mistakes which can be made in a very narrow field"

Niels BOHR

"$2^{30}(2^{31}-1)$ is the greatest perfect number that will ever be discovered, for, as they are merely curious without being useful, it is not likely that any person will attempt to find a number beyond it"

Peter BARLOW

"The Council of the Royal Society is a collection of men who elect each other to office and then dine together at the expense of this society to praise each other over wine and give each other medals."

Charles BABBAGE

"Unfortunately what is little recognized is that the most worthwhile scientific books are those in which the author clearly indicates what he does not know; for an author most hurts his readers by concealing difficulties."

Evariste GALOIS

"It is true that a mathematician who is not also something of a poet will never be a perfect mathematician."

Karl Theodor Wilhelm WEIERSTRASS

November

44	1	T	(1535) Giambattista DELLA PORTA
	2	F	(1815) George BOOLE
	3	S	(1867) Martin Wilhelm KUTTA (1878) Arthur Byron COBLE
	4	S	(1744) Johann (III) BERNOULLI (1865) Pierre Simon GIRARD
45	5	M	(1848) James Whitbread Lee GLAISHER (1930) John Frank ADAMS
	6	T	(1781) Giovanni Antonio Amedeo PLANA
	7	W	(1660) Thomas Fantet DE LAGNY (1799) Karl Heinrich GRAFFE (1898) Raphael SALEM
	8	T	(1656) Edmond HALLEY (1846) Eugenio BERTINI (1848) Fredrich Ludwig Gottlob FREGE (1854) Johannes Robert RYDBERG (1869) Felix HAUSDORFF
	9	F	(1847) Carlo Alberto CASTIGLIANO (1885) Theodor Franz Eduard KALUZA (1885) Hermann Klaus Hugo WEYL (1906) Jaroslav Borisovich LOPATYNSKY (1922) Imre LAKATOS
	10	S	(1829) Helwin Bruno CHRISTOFFEL
	11	S	(1904) John Henry Constantine WHITEHEAD
46	12	M	(1825) Michail Egorovich VASHCHENKO-ZAKHARCHENKO (1842) John William STRUTT Lord RAYLEIGH (1927) Yutaka TANIYAMA
	13	T	(1876) Ernest Julius WILKZYNSKY (1878) Max Wilhelm DEHN
	14	W	(1845) Ulisse DINI
	15	T	(1688) Louis Bertrand CASTEL (1793) Michel CHASLES (1794) Franz Adolph TAURINUS
	16	F	(1835) Eugenio BELTRAMI
	17	S	(1597) Henry GELLIBRAND (1717) Jean Le Rond D'ALEMBERT (1790) August Ferdinand MOBIUS
	18	S	(1872) Giovanni Enrico Eugenio VACCA (1927) Jon Leslie BRITTON
47	19	M	(1894) Heinz HOPF (1900) Michail Alekseevich LAVRENTEV (1901) Nina Karlovna BARI
	20	T	(1889) Edwin Powell HUBBLE (1924) Benoit MANDELBROT
	21	W	(1867) Dimitri SINTSOV
	22	T	(1803) Giusto BELLAVITIS (1840) Emile Michel Hyacinte LEMOINE
	23	F	(1616) John WALLIS (1820) Issac TODHUNTER
	24	S	(1549) Duncan MacLaren Young SOMERVILLE (1909) Gerhard GENTZEN
	25	S	(1873) Claude Louis MATHIEU (1841) Fredrich Wilhelm Karl Ernst SCHRODER
48	26	M	(1894) Norbert WIENER (1946) Enrico BOMBIERI
	27	T	(1867) Arthur Lee DIXON
	28	W	(1898) John WISHART
	29	T	(1803) Christian Andreas DOPPLER (1849) Horace LAMB (1879) Nikolay Mitrofanovich KRYLOV
	30	F	(1549) Sir Henry SAVILE

2nd IMO – 1960

In the isosceles trapezoid $ABCD$ (AB parallel to DC, and $BC = AD$), let $AB = a$, $CD = c$ and let the perpendicular distance from A to CD be h. Show how to construct all points X on the axis of symmetry such that $\angle BXC = \angle AXD = 90^\circ$. Find the distance of each such X from AB and from CD. What is the condition for such points to exist?

The Wonderful World of Statistics

Numbers are like people; torture them enough and they'll tell you anything.

Not exactly an Horoscope

The Sun reaches **Scorpio** on the 24th, people born in this period deny, and claim to be born later.

The Sun reaches **Ophiuchus** on the 30th, people born in this period are envied from all others, because when they say "Ophiuchus" the astrologists fall silent.

The British Mathematical Colloquium consists of three days of mathematics with no dogs and no wives.

John Henry WHITEHEAD

My work has always tried to unite the true with the beautiful and when I had to choose one or the other, I usually chose the beautiful.

Hermann WEYL

Whereas Nature does not admit of more than three dimensions ... it may justly seem very improper to talk of a solid ... drawn into a fourth, fifth, sixth, or further dimension.

John WALLIS

"Of the many forms of false culture, a premature converse with abstractions is perhaps the most likely to prove fatal to the growth of a masculine vigour of intellect."

George BOOLE

"A scientist can hardly meet with anything more undesirable than to have the foundations give way just as the work is finished. I was put in this position by a letter from Mr. Bertrand Russell when the work was nearly through the press."

Fredrich Ludwig Gottlob FREGE

"Logic is the hygiene the mathematician practices to keep his ideas healthy and strong."

Hermann Klaus Hugo WEYL

" The modern physicist is a quantum theorist on Monday, Wednesday, and Friday and a student of gravitational relativity theory on Tuesday, Thursday, and Saturday. On Sunday he is neither, but is praying to his God that someone, preferably himself, will find the reconciliation between the two views. "

Benoit MANDELBROT

December

48	**1**	S	(1792) Nikolay Yvanovich LOBACHEVSKY
	2	S	(1831) Paul David Gustav DU BOIS-RAYMOND (1901) George Frederick James TEMPLE
49	**3**	M	(1903) Sidney GOLDSTEIN (1924) John BACKUS
	4	T	(1795) Thomas CARLYLE
	5	W	(1868) Arnold Johannes Wilhelm SOMMERFELD (1901) Werner Karl HEISENBERG
	6	T	(1682) Giulio Carlo FAGNANO dei Toschi
	7	F	(1647) Giovanni CEVA (1823) Leopold KRONECKER (1830) Antonio Luigi Gaudenzio Giuseppe CREMONA
	8	S	(1508) Regnier GEMMA FRISIUS (1865) Jaques Salomon HADAMARD (1919) Julia Bowman ROBINSON
	9	S	(1883) Nikolai Nikolaievich LUZIN (1906) Grace Brewster MURRAY HOPPER (1917) Sergei Vasilovich FOMIN
50	**10**	M	(1804) Karl Gustav Jacob JACOBI (1815) Augusta Ada KING Countess of LOVELACE
	11	T	(1882) Max BORN
	12	W	(1832) Peter Ludwig Mejdell SYLOW
	13	T	(1724) Franz Ulrich Theodosius AEPINUS (1887) George POLYA
	14	F	(1546) Tycho BRAHE
	15	S	(1802) Janos BOLYAI
	16	S	(1804) Wiktor Yakovievich BUNYAKOWSKY
51	**17**	M	(1706) Gabrielle Emile Le Tonnelier de Breteuil du CHATELET (1835) Felice CASORATI (1842) Marius Sophus LIE (1900) Dame Mary Lucy CARTWRIGHT
	18	T	(1917) Roger LYNDON
	19	W	(1783) Charles Julien BRIANCHON (1854) Marcel Louis BRILLOUIN
	20	T	(1494) Oronce FINE (1648) Tommaso CEVA (1875) Francesco Paolo CANTELLI
	21	F	(1878) Jan LUKASIEVIKZ (1932) John Robert RINGROSE
	22	S	(1824) Francesco BRIOSCHI (1859) Otto Ludwig HOLDER (1877) Tommaso BOGGIO (1887) Srinivasa Aiyangar RAMANUJAN
	23	S	(1872) Georgii Yurii PFEIFFER
52	**24**	M	(1822) Charles HERMITE (1868) Emmanuel LASKER
	25	T	(1642) Isaac NEWTON (1900) Antoni ZYGMUND
	26	W	(1780) Mary Fairfax Greig SOMERVILLE (1791) Charles BABBAGE
	27	T	(1571) Johannes KEPLER (1654) Jacob (Jacques) BERNOULLI
	28	F	(1808) Athanase Louis Victoire DUPRE` (1882) Arthur Stanley EDDINGTON (1903) John von NEUMANN
	29	S	(1856) Thomas Jan STIELTJES
	30	S	(1897) Stanislaw SAKS
1	**31**	M	(1872) Volodymyr LEVIYTSKY (1896) Carl Ludwig SIEGEL (1952) Vaughan Frederick Randall JONES

3rd IMO – 1961

Solve the equation

$$\cos^n x - \sin^n x = 1,$$

where n is a natural number.

The Wonderful World of Statistics

Lottery: A tax on the statistically-challenged.

Not exactly an Horoscope

The Sun reaches **Sagittarius** on the 18th, people born in this period talk a lot of the advantages of the astrologists, but till now they haven't said a thing.

There is no branch of mathematics, however abstract, which may not some day be applied to phenomena of the real world.

Nikolay LOBACHEWSKY

On the chessboard, lies and hypocrisy do not survive long. The creative combination lays bare the presumption of a lie, the merciless fact, culminating in the checkmate, contradicts the hypocrite.

Emmanuel LASKER

" Die ganze Zahl schuf der liebe Gott, alles Übrige ist Menschenwerk."

Leopold KRONECKER

"The shortest path between two truths in the real domain passes through the complex domain."

Jaques Salomon HADAMARD

" Now it is quite clear to me that there are no solid spheres in the heavens, and those that have been devised by authors to save the appearances, exist only in their imagination, for the purpose of permitting the mind to conceive the motion which the heavenly bodies trace in their courses."

Tycho BRAHE

"Mathematical discoveries, like springtime violets in the woods, have their season which no human can hasten or retard."

Janos BOLYAI

"The Analytical Engine weaves algebraic patterns, just as the Jacquard loom weaves flowers and leaves"

Augusta Ada KING Countess of LOVELACE

"An expert is someone who knows some of the worst mistakes that can be made in his subject, and how to avoid them"

Werner Karl HEISENBERG

" Analysis takes back with one hand what it gives with the other. I recoil in fear and loathing from that deplorable evil: continuous functions with no derivatives."

Charles HERMITE

" Priusquam autem ad creationem, hoc est ad finem omnis disputationis, veniamus: tentanda omnia existimo"

Johannes KEPLER