

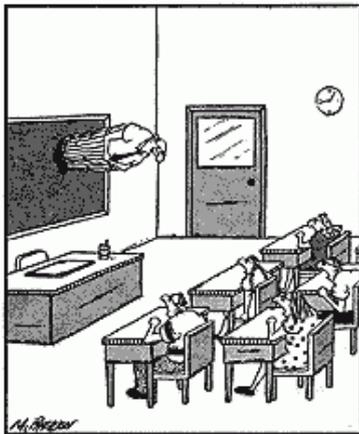


Rudi Mathematici

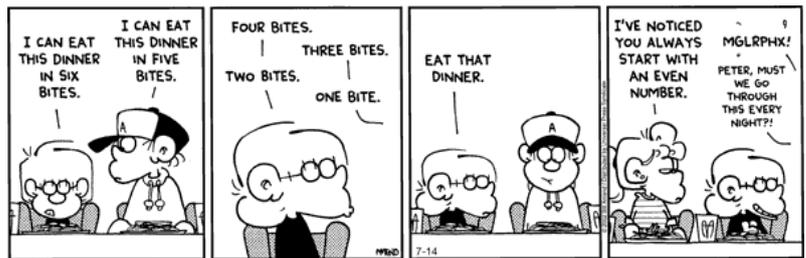
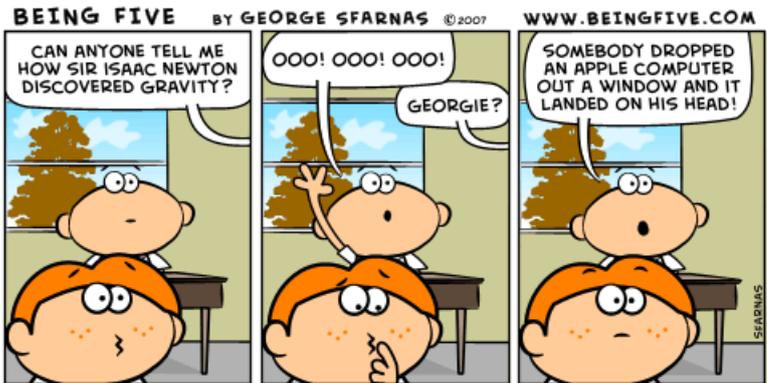
$$x^4 - 8200x^3 + 25213040x^2 - 34452464000x + 17652769695744 = 0$$



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"Good morning, and welcome to The Wonders of Physics."



1	1	T	(1803) Guglielmo LIBRI Carucci dalla Sommaja (1878) Agner Krarup ERLANG (1894) Satyendranath BOSE (1912) Boris GNEDENKO
	2	W	(1822) Rudolf Julius Emmanuel CLAUSIUS (1905) Lev Genrichovich SHNIRELMAN (1938) Anatoly SAMOILENKO
	3	T	(1917) Yuri Alexeievich MITROPOLSHY
	4	F	(1643) Isaac NEWTON
	5	S	(1838) Marie Ennemond Camille JORDAN (1871) Federigo ENRIQUES (1871) Gino FANO
	6	S	(1807) Jozeph Mitza PETZVAL (1841) Rudolf STURM
2	7	M	(1871) Felix Edouard Justin Emile BOREL (1907) Raymond Edward Alan Christopher PALEY
	8	T	(1888) Richard COURANT (1924) Paul Moritz COHN (1942) Stephen William HAWKING
	9	W	(1864) Vladimir Adreievich STELKOV
	10	T	(1875) Issai SCHUR (1905) Ruth MOUFANG
	11	F	(1545) Guidobaldo DEL MONTE (1707) Vincenzo RICCATI (1734) Achille Pierre Dionis DU SEJOUR
	12	S	(1906) Kurt August HIRSCH
3	13	S	(1864) Wilhelm Karl Werner Otto Fritz Franz WIEN (1876) Luther Pfahler EISENHART (1876) Erhard SCHMIDT
	14	M	(1902) Alfred TARSKI
	15	T	(1704) Johann CASTILLON (1717) Matthew STEWART (1850) Sofia Vasilievna KOVALEVSKAJA
	16	W	(1801) Thomas KLAUSEN
	17	T	(1847) Nikolay Egorovich ZUKOWSKY (1858) Gabriel KOENIGS
	18	F	(1856) Luigi BIANCHI (1880) Paul EHRENFEST
4	19	S	(1813) Rudolf Friedrich Alfred CLEBSCH (1879) Guido FUBINI (1908) Aleksandr Gennadievich KUROV
	20	S	(1775) Andre' Marie AMPERE (1895) Gabor SZEGO (1904) Renato CACCIOPOLI
	21	M	(1846) Pieter Hendrik SCHOUTE (1915) Yuri Vladimirovich LINNIK
	22	T	(1592) Pierre GASSENDI (1908) Lev Davidovich LANDAU
	23	W	(1840) Ernst ABBE (1862) David HILBERT
	24	T	(1891) Abram Samoilovitch BESICOVITCH (1914) Vladimir Petrovich POTAPOV
5	25	F	(1627) Robert BOYLE (1736) Joseph-Louis LAGRANGE (1843) Karl Herman Amandus SCHWARTZ
	26	S	(1799) Benoit Paul Emile CLAPEYRON
	27	S	(1832) Charles Lutwidge DODGSON
	28	M	(1701) Charles Marie de LA CONDAMINE (1892) Carlo Emilio BONFERRONI
	29	T	(1817) William FERREL (1888) Sidney CHAPMAN
	30	W	(1619) Michelangelo RICCI
5	31	T	(1715) Giovanni Francesco Fagnano dei Toschi (1841) Samuel LOYD (1896) Sofia Alexandrovna JANOWSKAJA

USAMO 1997 – Problem 1

Let p_1, p_2, p_3, \dots be the prime numbers listed in increasing order, and let x_0 be a real number between 0 and 1. For positive integer k , define:

$$x_k = \begin{cases} 0 & \text{if } x_{k-1} = 0, \\ \left\{ \frac{p_k}{x_{k-1}} \right\} & \text{if } x_{k-1} \neq 0, \end{cases}$$

where $\{x\}$ denotes the fractional part of x .

Find, with proof, all x_0 satisfying $0 < x_0 < 1$ for which the sequence x_0, x_1, x_2, \dots eventually becomes 0.

Why Astronomy is better than Sex:

If you get tired, wait ten minutes and try it again.

Statisticians

What do you get when you cross a statistician with a chiropractor?

You get an adjusted R squared from a BACKward regression problem.

"I know not what I appear to the world, but to myself I seem to have been only like a boy playing on the sea-shore, and diverting myself in now and then finding a smoother pebble or a prettier shell, whilst the great ocean of truth lay all undiscovered before me"

Isaac NEWTON

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

Camille JORDAN

"It's very good jam," said the Queen.

"Well, I don't want any to-day, at any rate."

"You couldn't have it if you did want it," the Queen said. "The rule is jam tomorrow and jam yesterday but never jam to-day."

"It must come sometimes to 'jam to-day,'" Alice objected.

"No it can't," said the Queen. "It's jam every other day; to-day isn't any other day, you know."

"I don't understand you," said Alice. "It's dreadfully confusing."

Charles DOGSON

"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

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

USAMO 1997 – Problem 2

Let ABC be a triangle, and draw isosceles triangles BCD , CAE , ABF externally to ABC , with BC , CA , AB as their respective bases. Prove that the lines through A , B , C perpendicular to the lines \overline{EF} , \overline{FD} , \overline{DE} , respectively, are concurrent.

Why Astronomy is better than Sex:

Nobody cares if you are ugly.

Statisticians

A statistician is someone who is skilled at drawing a precise line from an unwarranted assumption to a foregone conclusion.

"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

...an incorrect theory, even if it cannot be inhibited by any contradiction that would refute it, is none the less incorrect, just as a criminal policy is none the less criminal even if it cannot be inhibited by any court that would curb it.

Luitzen BROUWER

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

Dominique ARAGO

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

USAMO 1997 – Problem 3

Prove that for any integer n , there exists a unique polynomial Q with coefficients in $\{1, 2, 3, \dots, 9\}$ such that $Q(-2) = Q(-5) = n$.

Why Astronomy is better than Sex:

Forty years from now, you can still participate regularly.

Why pi is inferior to e

You can't confuse e with a food product.

Why e is inferior to pi

e is less challenging to spell than pi.

"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

The mathematician's best work is art, a high perfect art, as daring as the most secret dreams of imagination, clear and limpid. Mathematical genius and artistic genius touch one another.

Gosta MITTAG-LEFFLER

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

Paul ERDOS

The profound study of nature is the most fertile source of mathematical discoveries.

Jean Baptiste FOURIER

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

Pierre Simon de LAPLACE

14	1	T	(1640) Georg MOHR (1776) Marie-Sophie GERMAIN (1895) Alexander Craig AITKEN	
	2	W	(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	F	(1809) Benjamin PEIRCE (1842) Francois Edouard Anatole LUCAS (1949) Shing-Tung YAU	
	5	S	(1588) Thomas HOBBS (1607) Honore' FABRI (1622) Vincenzo VIVIANI (1869) Sergi Alexeievich CHAPLYGIN	
	6	S	(1801) William Hallows MILLER	
15	7	M	(1768) Francois Joseph FRANCAIS	
	8	T	(1903) Marshall Harvey STONE	
	9	W	(1791) George PEACOCK (1816) Charles Eugene DELAUNAY (1919) John Presper HECKERT	
	10	T	(1857) Henry Ernest DUDENEY	
	11	F	(1953) Andrew John WILES	
	12	S	(1794) Germinal Pierre DANDELIN (1852) Carl Louis Ferdinand Von LINDEMANN (1903) Jan TINBERGEN	
	13	S	(1728) Paolo FRISI (1813) Duncan Farquharson GREGORY (1879) Francesco SEVERI	
16	14	M	(1629) Christiaan HUYGENS	
	15	T	(1452) Leonardo da VINCI (1548) Pietro Antonio CATALDI (1707) Leonhard EULER (1809) Herman Gunther GRASSMANN	
	16	W	(1682) John HADLEY (1823) Ferdinand Gotthold Max EISENSTEIN	
	17	T	(1798) Etienne BOBILLIER (1853) Arthur Moritz SCHONFLIES	
	18	F	(1907) Lars Valerian AHLFORS (1918) Hsien Chung WANG (1949) Charles Loois FEFFERMAN	
	19	S	(1880) Evgeny Evgenievich SLUTSKY (1883) Richard VIN MISES (1901) Kiyoshi OKA (1905) Charles EHRESMANN	
	20	S	(1839) Francesco SIACCI	
	17	21	M	(1652) Michel ROLLE (1774) Jean Baptiste BIOT (1875) Teiji TAKAGI
		22	T	(1811) Otto Ludwig HESSE (1887) Harald August BOHR
		23	W	(1858) Max Karl Ernst Ludwig PLANCK
24		T	(1863) Giovanni VAILATI	
25		F	(1849) Felix Christian KLEIN (1900) Wolfgang PAULI (1903) Andrei Nicolayevich KOLMOGOROV	
26		S	(1889) Ludwig Josef Johan WITTENGSTEIN	
27		S	(1755) Marc-Antoine PARSEVAL des Chenes	
18	28	M	(1906) Kurt GODEL	
	29	T	(1854) Jules Henri POINCARÉ	
	30	W	(1777) Johann Carl Friedrich GAUSS (1916) Claude Elwood SHANNON	

USAMO 1997 – Problem 4

To clip a convex n -agon means to choose a pair of consecutive sides AB , BC and to replace them by the three segments AM , MN and NC , where M is the midpoint of AB and N is the midpoint of BC . In other words, one cuts off the triangle MBN to obtain a convex $(n+1)$ -agon. A regular hexagon P_6 of area 1 is clipped to obtain a heptagon P_7 . Then P_7 is clipped (in one of the seven possible ways) to obtain an octagon P_8 , and so on. Prove that no matter how the clippings are done, the area of P_n is greater than $\frac{1}{3}$, for all $n \geq 6$.

Why Astronomy is better than Sex:

Doesn't matter if kids hear you moaning, oohing and aahing.

Why pi is inferior to e

You don't need to know Greek to be able to use e.

Why e is inferior to pi

$e \approx 2.718281828459045$, which can be easily memorized to its billionth place, whereas pi needs "skills" to be memorized.

"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 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

18	1	T	(1825) Johann Jacob BALMER
	2	F	(1860) S'Arcy Wentworth THOMPSON (1905) Kazimierz ZARANKIEWITZ
	3	S	(1842) Otto STOLZ (1860) Vito VOLTERRA
	4	S	(1845) William Kingdon CLIFFORD
19	5	M	(1833) Lazarus Emmanuel FUCHS (1897) Francesco Giacomo TRICOMI
	6	T	(1872) Willem DE SITTER (1906) Andre' VEIL
	7	W	(1926) Alexis Claude CLAIRAUT (1854) Giuseppe VERONESE (1881) Ebenezer CUNNINGHAM (1896) Pavel Sergieievich ALEXANDROV
	8	T	(1859) Johan Ludvig William Valdemar JENSEN
9	F	(1746) Gaspard MONGE (1876) Gilbert Ames BLISS	
	10	S	(1788) Augustin Jean FRESNEL (1847) William Karl Joseph KILLING (1958) Piotr Rizerovich SILVERBRAHMS
11	S	(1918) Richard Phillips FEYNMAN	
	12	M	(1845) Pierre Rene'Jean Baptiste Henry BROCARD (1902) Frank YATES
20	13	T	(1750) Lorenzo MASCHERONI
	14	W	(1832) Rudolf Otto Sigmund LIPSCHITZ (1863) John Charles FIELDS
15	T	(1939) Brian HARTLEY	
	16	F	(1718) Maria Gaetana AGNESI (1821) Pafnuti Lvovi CHEBYSHEV
17	S	(1940) Alan KAY	
	18	S	(1850) Oliver HEAVISIDE (1892) Bertrand Arthur William RUSSELL
21	19	M	(1919) Georgii Dimitrievich SUVOROV
	20	T	(1861) Henry Seely WHITE
21	W	(1471) Albrecht DURER (1792) Gustave Gaspard de CORIOLIS	
	22	T	(1865) Alfred Cardew DIXON
23	F	(1914) Lipa BERS	
	24	S	(1544) William GILBERT
25	S	(1838) Karl Mikailovich PETERSON	
	26	M	(1667) Abraham DE MOIVRE (1896) Yuri Dimitrievich SOKOLOV
22	27	T	(1862) John Edward CAMPBELL
	28	W	(1676) Jacopo Francesco RICCATI (1710) Johann (II) BERNOULLI
29	T	(1882) Harry BATEMAN	
	30	F	(1814) Eugene Charles CATALAN
31	S	(1926) John KEMENY	

USAMO 1997 – Problem 5

Prove that, for all positive real numbers a , b , c :

$$(a^3 + b^3 + abc)^{-1} +$$

$$(b^3 + c^3 + abc)^{-1} +$$

$$(c^3 + a^3 + abc)^{-1} \leq (abc)^{-1}$$

Why Astronomy is better than Sex:

You can do it all night.

Why pi is inferior to e

e stands for Euler's Number, pi doesn't stand for squat.

Why e is inferior to pi

The character for e is so cheap that it can be found on a keyboard. But PI is special (it's under "special symbols" in word processor programs.)

"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 that there is a great amount of thought expressed in very few words. in this sense, formulas like $e^{\pi}+1=0$ are poems."

Lipa BERS

22	1	S	(1796) Sadi Leonard Nicolas CARNOT (1851) Edward Bailey ELLIOTT (1899) Edward Charles TITCHMARSH	
23	2	M	(1895) Tibor RADO'	
	3	T	(1659) David GREGORY	
	4	W	(1809) John Henry PRATT	
	5	T	(1814) Pierre Laurent WANTZEL (1819) John Couch ADAMS	
	6	F	(1436) Johann Muller REGIOMONTANUS (1857) Aleksandr Michailovitch LYAPUNOV (1906) Max ZORN	
	7	S	(1863) Edward Burr VAN VLECK	
	8	S	(1625) Giovanni Domenico CASSINI (1858) Charlotte Angas SCOTT (1860) Alicia Boole STOTT	
	24	9	M	(1885) John Edensor LITTLEWOOD
10		T	(940) Mohammad ABU'M Wafa Al-Buzjani (1887) Vladimir Ivanovich SMIRNOV	
11		W	(1937) David Bryant MUMFORD	
12		T	(1888) Zygmunt JANYSZEWSKI	
13		F	(1831) James Clerk MAXWELL (1876) William Sealey GOSSET (Student) (1928) John Forbes NASH	
14		S	(1736) Charles Augustin de COULOMB (1856) Andrei Andreyevich MARKOV (1903) Alonzo CHURCH	
15		S	(1640) Bernard LAMY (1894) Nikolai Gregorievich CHEBOTARYOV	
25		16	M	(1915) John Wilder TUKEY
	17	T	(1898) Maurits Cornelius ESCHER	
	18	W	(1858) Andrew Russell FORSYTH (1884) Charles Ernest WEATHERBURN	
	19	T	(1623) Blaise PASCAL (1902) Wallace John ECKERT	
	20	F	(1873) Alfred LOEWY	
	21	S	(1781) Simeon Denis POISSON (1828) Giuseppe BRUNO	
	22	S	(1823) Mario PIERI (1864) Hermann MINKOWSKY (1910) Konrad ZUSE	
	26	23	M	(1912) Alan Mathison TURING
		24	T	(1880) Oswald VEBLEN
		25	W	(1908) William Van Orman QUINE
26		T	(1824) William THOMPSON, Lord Kelvin (1918) Yudell Leo LUKE	
27		F	(1806) Augustus DE MORGAN	
28		S	(1875) Henri Leon LEBESGUE	
29		S	(1888) Aleksandr Aleksandrovich FRIEDMANN	
27		30	M	(1791) Felix SAVART

USAMO 1997 – Problem 6

Suppose the sequence of non-negative integers

$a_1, a_2, \dots, a_{1997}$ satisfies

$$a_i + a_j \leq a_{i+j} \leq a_i + a_j + 1$$

for all $i, j \geq 1$ with $i + j \leq 1997$. Show that there exists a real number x such that $a_n = \lfloor nx \rfloor$ for all $1 \leq n \leq 1997$.

Why Astronomy is better than Sex:

Less guilt the next morning.

Why pi is inferior to e

e is easier to spell than pi.

Why e is inferior to pi

To read pi, you don't have to know that Euler's name is really pronounced Oiler.

"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 TITCHMARSH

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 MINKOWSKY

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

Maurits Cornelius ESCHER

Life is good for only two things, discovering mathematics and teaching mathematics.

Simeon Denis POISSON

"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

27	1	T	(1643) Gottfried Wilhelm von LEIBNIZ (1788) Jean Victor PONCELET
	2	W	(1820) William John Racquorn RANKINE (1852) William BURNSIDE
	3	T	(1807) Ernest Jean Philippe Fauque de JONQUIERE (1897) Jesse DOUGLAS
	4	F	(1906) Daniel Edwin RUTHERFORD (1917) Michail Samuilovich LIVSIC
	5	S	(1936) James MIRRLEES
	6	S	(1849) Alfred Bray KEMPE
28	7	M	(1816) Johann Rudolf WOLF (1906) William FELLER (1922) Vladimir Aleksandrovich MARCHENKO
	8	T	(1760) Christian KRAMP
	9	W	(1845) George Howard DARWIN
	10	T	(1862) Roger COTES (1868) Oliver Dimon KELLOGG
	11	F	(1857) Sir Joseph LARMOR (1890) Giacomo ALBANESE
	12	S	(1875) Ernest Sigismund FISCHER (1895) Richard BUCKMINSTER FULLER
	13	S	(1527) John DEE (1741) Karl Friedrich HINDENBURG
29	14	M	(1671) Jacques S'ALLONVILLE (1793) George GREEN
	15	T	(1865) Wilhelm WIRTINGER (1906) Adolph Andrej Pavlovich YUSHKEVICH
	16	W	(1678) Jakob HERMANN (1903) Irmgard FLUGGE-LOTZ
	17	T	(1831) Victor Mayer Amedee' MANNHEIM (1837) Wilhelm LEXIS
	18	F	(1013) Hermann von REICHENAU (1635) Robert HOOKE (1853) Hendrich Antoon LORENTZ
	19	S	(1768) Francois Joseph SERVOIS
	20	S	(1876) Otto BLUMENTHAL (1947) Gerd BINNIG
30	21	M	(1620) Jean PICARD (1848) Emil WEYR (1849) Robert Simpson WOODWARD
	22	T	(1784) Friedrich Wilhelm BESSEL
	23	W	(1775) Etienne Louis MALUS (1854) Ivan SLEZYNSKY
	24	T	(1851) Friedrich Herman SCHOTTKY (1871) Paul EPSTEIN (1923) Christine Mary HAMILL
	25	F	(1808) Johann Benedict LISTING
	26	S	(1903) Kurt MAHLER
	27	S	(1667) Johann BERNOULLI (1801) George Biddell AIRY (1848) Lorand Baron von EOTVOS (1871) Ernst Friedrich Ferdinand ZERMELO
	31	28	M
29		T	(1898) Isidor Isaac RABI
30		W	(1889) Vladimir Kosma ZWORYKN
31		T	(1704) Gabriel CRAMER (1712) Johann Samuel KOENIG

USAMO 1998 – Problem 1

Suppose that the set $\{1, 2, \dots, 1998\}$ has been partitioned into disjoint pairs $\{a_i, b_i\}$ ($1 \leq i \leq 999$) so that for all i , $|a_i - b_i|$ equals 1 or 6. Prove that the sum $|a_1 - b_1| + |a_2 - b_2| + \dots + |a_{999} - b_{999}|$ ends in the digit 9.

Why Astronomy is better than Sex:

You can experience multiple objects in a single session

Why pi is inferior to e

pi \approx 3.14 while e \approx 2.718281828459045

Why e is inferior to pi

Pi is much shorter and easier to say than "Euler's Number"

"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

"CEIHOSSOTTUU"

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

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

31	1	F	(1861) Ivar Otto BENDIXSON (1881) Otto TOEPLITZ
	2	S	(1856) Ferdinand RUDIO (1902) Mina Spiegel REES
	3	S	(1914) Mark KAC
32	4	M	(1805) Sir William Rowan HAMILTON (1838) John VENN
	5	T	(1802) Niels Henrik ABEL
	6	W	(1638) Nicolas MALEBRANCHE (1741) John WILSON
	7	T	(1868) Ladislaus Josephowitsch BORTKIEWITZ
	8	F	(1902) Paul Adrien Maurice DIRAC
	9	S	(1537) Francesco BAROZZI (Franciscus Barocius)
	10	S	(1602) Gilles Personne de ROBERVAL
33	11	M	(1730) Charles BOSSUT (1842) Enrico S'OIDIO
	12	T	(1882) Jules Antoine RICHARD (1887) Erwin Rudolf Josef Alexander SCHRODINGER
	13	W	(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	F	(1863) Aleksei Nikolaevich KRYLOV (1892) Louis Pierre Victor duc de BROGLIE (1901) Petr Sergeevich NOVIKOV
	16	S	(12773) Louis Beniamin FRANCOEUR (1821) Arthur CAYLEY
	17	S	(1601) Pierre de FERMAT
34	18	M	(1685) Brook TAYLOR
	19	T	(1646) John FLAMSTEED (1739) Georg Simon KLUGEL
	20	W	(1710) Thomas SIMPSON (1863) Corrado SEGRE (1882) Wacław SIERPINSKI
	21	T	(1789) Augustin Louis CAUCHY
	22	F	(1647) Denis PAPIN
	23	S	(1683) Giovanni POLENI (1829) Moritz Benedikt CANTOR
	24	S	(1561) Bartholomeo PITISCUS (1942) Karen Keskulla UHLENBECK
35	25	M	(1561) Philip van LANSBERGE (1844) Thomas MUIR
	26	T	(1728) Johann Heinrich LAMBERT (1875) Giuseppe VITALI
	27	W	(1858) Giuseppe PEANO
	28	T	(1796) Ireneé Jules BIENAYME'
	29	F	(1904) Leonard ROTH
	30	S	(1856) Carle David Tolme' RUNGE (1906) Olga TAUSSKY-TODD
	31	S	(1821) Hermann Ludwig Ferdinand von HELMHOLTZ

USAMO 1998 – Problem 2

Let C_1 and C_2 be concentric circles, with C_2 in the interior of C_1 . From a point A of C_2 one draws the tangent AB to C_2 ($B \in C_2$). Let C be the second point of intersection of AB and C_1 , and let D the midpoint of AB . A line passing through A intersects C_2 at E and F in such a way that the perpendicular bisectors of DE and CF intersect at a point M on AB . Find, with proof, the ratio AM/MC .

Why Astronomy is better than Sex:

Person you're with doesn't fantasize you're someone else.

Why pi is inferior to e

The character for e can be found on a keyboard, but pi sure can't.

Why e is inferior to pi

e is named after a person, but pi stands for itself.

"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."

Ferdinand 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

36	1	M	(1659) Joseph SAURIN (1835) William Stankey JEVONS
	2	T	(1878) Mauriche Rene' FRECHET (1923) Rene' THOM
	3	W	(1814) James Joseph SYLVESTER (1884) Solomon LEFSCHETZ (1908) Lev Semenovich PONTRYAGIN
	4	T	(1809) Luigi Federico MENABREA
	5	F	(1667) Giovanni Girolamo SACCHERI (1725) Jean Etienne MONTUCLA
	6	S	(1859) Boris Jakovlevich BUKREEV (1863) Dimitri Aleksandrovich GRAVE
	7	S	(1707) George Louis Leclerc comte de BUFFON (1955) Efim ZELMANOV
37	8	M	(1584) Gregorius SAINTE-VINCENT (1588) Marin MERSENNE
	9	T	(1860) Frank MORLEY
	10	W	(1839) Charles Sanders PEIRCE
	11	T	(1623) Stefano degli ANGELI (1877) sir James Hopwood JEANS
	12	F	(1891) Antoine Andre' Louis REYNAUD (1900) Haskell Brooks CURRY
	13	S	(1873) Constantin CARATHEODORY (1885) Wilhelm Johann Eugen BLASCHKE
	14	S	(1858) Henry Burchard FINE (1891) Ivan Matveevich VINOGRADOV
38	15	M	(973) Abu Arrayhan Muhammad ibn Ahmad AL'BIRUNI (1886) Paul Pierre LEVY
	16	T	(1494) Francisco MAUROLICO (1736) Johann Nikolaus TETENS
	17	W	(1743) Marie Jean Antoine Nicolas de Caritat de CONDORCET (1826) Georg Friedrich Bernhard RIEMANN
	18	T	(1752) Adrien Marie LEGENDRE
	19	F	(1749) Jean Baptiste DELAMBRE
	20	S	(1842) Alexander Wilhelm von BRILL (1861) Frank Nelson COLE
	21	S	(1899) Juliusz Pawel SCHAUDER
39	22	M	(1765) Paolo RUFFINI (1769) Louis PUISSANT (1803) Jaques Charles Francois STURM
	23	T	(1768) William WALLACE (1900) David van DANTZIG
	24	W	(1501) Girolamo CARDANO (1625) Johan DE WITT (1801) Michail Vasilevich OSTROGRADSKI
	25	T	(1819) George SALMON (1888) Stefan MAZURKIEWICZ
	26	F	(1688) Willem Jakob 's GRAVESANDE (1854) Percy Alexander MACMAHON (1891) Hans REICHENBACH
	27	S	(1855) Paul Emile APPEL (1876) Earle Raymond HEDRICK (1919) James Hardy WILKINSON
	28	S	(1698) Pierre Louis Moreau de MAUPERTUIS (1761) Ferdinand Francois Desire' Budan de BOISLAURENT (1873) Julian Lowell COOLIDGE
40	29	M	(1561) Adriaan van ROOMEN (1812) Adolph GOPEL
	30	T	(1775) Robert ADRAIN (1829) Joseph WOLSTENHOLME (1883) Ernst HELLINGER

USAMO 1998, Problem 3

Let a_0, a_1, \dots, a_n be numbers from the interval $(0, \pi/2)$ such that

$$\sum_{i=0}^n \tan\left(a_i - \frac{\pi}{4}\right) \geq n - 1.$$

Prove that

$$\prod_{i=0}^n \tan\left(a_i - \frac{\pi}{4}\right) \geq n^{n+1}.$$

Why Astronomy is better than Sex:

There is less shame when purchasing the equipment

Why pi is inferior to e

Everybody fights for their piece of the pie.

Why e is inferior to pi

People mistakenly confuse Euler's Number (e) with Euler's Constant (gamma). There is no confusion with the one and only PI.

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

René 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

It is a matter for considerable regret that Fermat did not leave us with the proofs of the theorems he discovered. In truth, Messrs Euler and Lagrange have proved most of these theorems, and have even substituted extensive theories for the isolated propositions of Fermat. But there are several proofs which have resisted their efforts.

Adrien-Marie LEGENDRE

[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

40	1	W	(1671) Luigi Guido GRANDI (1898) Bela KEREKJARTO'	
	2	T	(1825) John James WALKER (1908) Arthur ERDELYI	
	3	F	(1944) Pierre Rene' DELIGNE	
	4	S	(1759) Louis Francois Antoine ARBOGAST (1797) Jerome SAVARY	
	5	S	(1732) Nevil MASKELYNE (1781) Bernhard Placidus Johann Nepomuk BOLZANO (1861) Thomas Little HEATH	
41	6	M	(1552) Matteo RICCI (1831) Julius Wilhelm Richard DEDEKIND (1908) Sergei Lvovich SOBOLEV	
	7	T	(1885) Niels BOHR	
	8	W	(1908) Hans Arnold HEILBRONN	
	9	T	(1581) Claude Gaspard BACHET de Meziriac (1704) Johann Andrea von SEGNER (1873) Karl SCHWARTZSCHILD	
	10	F	(1861) Heinrich Friedrich Karl Ludwig BURKHARDT	
	11	S	(1675) Samuel CLARKE (1777) Barnabe' BRISSON (1885) Alfred HAAR (1910) Cahit ARF	
	12	S	(1860) Elmer SPERRY	
	42	13	M	(1890) Georg FEIGL (1893) Kurt Werner Friedrich REIDEMEISTER (1932) John Griggs THOMSON
		14	T	(1687) Robert SIMSON (1801) Joseph Antoine Ferdinand PLATEAU (1868) Alessandro PADOA
		15	W	(1608) Evangelista TORRICELLI (1735) Jesse RAMSDEN (1776) Peter BARLOW
		16	T	(1879) Philip Edward Bertrand JOURDAIN
17		F	(1759) Jacob (II) BERNOULLI (1888) Paul Isaac BERNAYS	
18		S	(1741) John WILSON	
19		S	(1903) Jean Frederic Auguste DELSARTE (1910) Subrahmanyan CHANDRASEKHAR	
43		20	M	(1632) Sir Christopher WREN (1863) William Henry YOUNG (1865) Aleksandr Petrovich KOTELNIKOV
		21	T	(1677) Nicolaus (I) BERNOULLI (1823) Enrico BETTI (1855) Giovan Battista GUCCIA (1893) William Leonard FERRAR
	22	W	(1587) Joachim JUNGIVS (1895) Rolf Herman NEVANLINNA (1907) Sarvadaman CHOWLA	
	23	T	(1865) Piers BOHL	
	24	F	(1804) Wilhelm Eduard WEBER (1873) Edmund Taylor WITTAKER	
	25	S	(1811) Evariste GALOIS	
	26	S	(1849) Ferdinand Georg FROBENIUS (1857) Charles Max MASON (1911) Shiing-Shen CHERN	
44	27	M	(1678) Pierre Remond de MONTMORT (1856) Ernest William HOBSON	
	28	T	(1804) Pierre Francois VERHULST	
	29	W	(1925) Klaus ROTH	
	30	T	(1906) Andrej Nikolaevich TIKHONOV	
	31	F	(1815) Karl Theodor Wilhelm WEIERSTRASS	

USAMO 1998, Problem 4

A computer screen shows a 98×98 chessboard, coloured in the usual way. One can select with a mouse any rectangle with sides on the lines of the chessboard and click the mouse button: as a result, the colours in the selected rectangle switch (black becomes white, white becomes black). Find, with proof, the minimum number of mouse clicks needed to make the chessboard all one colour.

Why Astronomy is better than Sex:

The telescope isn't going to make you pay child support for the next eighteen years.

Why pi is inferior to e

$\ln(\pi^e)$ is a really nasty number, but $\ln(e^1) = 1$

Why e is inferior to pi

e you understand what it is even though you start learning it late when you're in pre-calculus. But pi, even after five or six years it's still hard to know what it really is.

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

I recognize the lion by his paw.

[After reading an anonymous solution to a problem that he realized was Newton's solution.]

Jacob (II) BERNOULLI

"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

44	1	S	(1535) Giambattista DELLA PORTA	
	2	S	(1815) George BOOLE	
45	3	M	(1867) Martin Wilhelm KUTTA (1878) Arthur Byron COBLE	
	4	T	(1744) Johann (III) BERNOULLI (1865) Pierre Simon GIRARD	
	5	W	(1848) James Whitbread Lee GLAISHER (1930) John Frank ADAMS	
	6	T	(1781) Giovanni Antonio Amedeo PLANA	
	7	F	(1660) Thomas Fantet DE LAGNY (1799) Karl Heinrich GRAFFE (1898) Raphael SALEM	
	8	S	(1656) Edmond HALLEY (1846) Eugenio BERTINI (1848) Fredrich Ludwig Gottlob FREGE (1854) Johannes Robert RYDBERG (1869) Felix HAUSDORFF	
	9	S	(1847) Carlo Alberto CASTIGLIANO (1885) Theodor Franz Eduard KALUZA (1885) Hermann Klaus Hugo WEYL (1906) Jaroslav Borisovich LOPATYNSKY (1922) Imre LAKATOS	
	46	10	M	(1829) Helwin Bruno CHRISTOFFEL
		11	T	(1904) John Henry Constantine WHITEHEAD
12		W	(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		F	(1845) Ulisse DINI	
15		S	(1688) Louis Bertrand CASTEL (1793) Michel CHASLES (1794) Franz Adolph TAURINUS	
16		S	(1835) Eugenio BELTRAMI	
47		17	M	(1597) Henry GELLIBRAND (1717) Jean Le Rond D'ALEMBERT (1790) August Ferdinand MOBIUS
		18	T	(1872) Giovanni Enrico Eugenio VACCA (1927) Jon Leslie BRITTON
	19	W	(1894) Heinz HOPF (1900) Michail Alekseevich LAVRENTEV (1901) Nina Karlovna BARI	
	20	T	(1889) Edwin Powell HUBBLE (1924) Benoit MANDELNBROT	
	21	F	(1867) Dimitri SINTSOV	
	22	S	(1803) Giusto BELLAVITIS (1840) Emile Michel Hyacinte LEMOINE	
	23	S	(1616) John WALLIS (1820) Issac TODHUNTER (1917) Elizabeth SCOTT	
	48	24	M	(1549) Duncan MacLaren Young SOMERVILLE (1909) Gerhard GENTZEN
		25	T	(1873) Claude Louis MATHIEU (1841) Fredrich Wilhelm Karl Ernst SCHRODER
26		W	(1894) Norbert WIENER (1946) Enrico BOMBIERI	
27		T	(1867) Arthur Lee DIXON	
28		F	(1898) John WISHART	
29		S	(1803) Christian Andreas DOPPLER (1849) Horace LAMB (1879) Nikolay Mitrofanovich KRYLOV	
30		S	(1549) Sir Henry SAVILE	

USAMO 1998, Problem 5

Prove that for every $n \geq 2$, there is a set S of n integers such that $(a-b)^2$ divides ab for every distinct $a, b \in S$.

Why Astronomy is better than Sex:

Guaranteed to get at least a little something in view.

Why pi is inferior to e

e is used in calculus while pi is used in baby geometry.

Why e is inferior to pi

e has an easy limit definition and infinite series. The limit definition of pi and the infinite series are much harder.

"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

The history of astronomy is a history of receding horizons.

Edwin HUBBLE

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

Hermann Klaus Hugo WEYL

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

John Henry Constantine WHITEHEAD

Algebra is generous: she often gives more than is asked for.

Jean D'ALEMBERT

"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 MANDELNBROT

49	1	M	(1792) Nikolay Yvanovich LOBACHEVSKY
	2	T	(1831) Paul David Gustav DU BOIS-RAYMOND (1901) George Frederick James TEMPLE
	3	W	(1903) Sidney GOLDSTEIN (1924) John BACKUS
	4	T	(1795) Thomas CARLYLE
	5	F	(1868) Arnold Johannes Wilhelm SOMMERFELD (1901) Werner Karl HEISENBERG
	6	S	(1682) Giulio Carlo FAGNANO dei Toschi
	7	S	(1647) Giovanni CEVA (1823) Leopold KRONECKER (1830) Antonio Luigi Gaudenzio Giuseppe CREMONA
50	8	M	(1508) Regnier GEMMA FRISIUS (1865) Jaques Salomon HADAMARD (1919) Julia Bowman ROBINSON
	9	T	(1883) Nikolai Nikolaievich LUZIN (1906) Grace Brewster MURRAY HOPPER (1917) Sergei Vasilovich FOMIN
	10	W	(1804) Karl Gustav Jacob JACOBI (1815) Augusta Ada KING Countess of LOVELACE
	11	T	(1882) Max BORN
	12	F	(1832) Peter Ludwig Mejdell SYLOW
	13	S	(1724) Franz Ulrich Theodosius AEPINUS (1887) George POLYA
	14	S	(1546) Tycho BRAHE
51	15	M	(1802) Janos BOLYAI
	16	T	(1804) Wiktor Yakovievich BUNYAKOWSKY
	17	W	(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	F	(1783) Charles Julien BRIANCHON (1854) Marcel Louis BRILLOUIN
	20	S	(1494) Oronce FINE (1648) Tommaso CEVA (1875) Francesco Paolo CANTELLI
	21	S	(1878) Jan LUKASIEVIKZ (1932) John Robert RINGROSE
52	22	M	(1824) Francesco BRIOSCHI (1859) Otto Ludwig HOLDER (1877) Tommaso BOGGIO (1887) Srinivasa Aiyangar RAMANUJAN
	23	T	(1872) Georgii Yurii PFEIFFER
	24	W	(1822) Charles HERMITE (1868) Emmanuel LASKER
	25	T	(1642) Isaac NEWTON (1900) Antoni ZYGMUND
	26	F	(1780) Mary Fairfax Greig SOMERVILLE (1791) Charles BABBAGE (1937) John Horton CONWAY
	27	S	(1571) Johannes KEPLER (1654) Jacob (Jacques) BERNOULLI
	28	S	(1808) Athanase Louis Victoire DUPRE (1882) Arthur Stanley EDDINGTON (1903) John von NEUMANN
1	29	M	(1856) Thomas Jan STIELTJES
	30	T	(1897) Stanislaw SAKS
	31	W	(1872) Volodymyr LEVIYTSKY (1896) Carl Ludwig SIEGEL (1952) Vaughan Frederick Randall JONES

USAMO 1998, Problem 6

Let $n \geq 5$ be an integer. Find the largest integer k (as a function of n) such that there exists a convex n -agon $A_1 A_2 \dots A_n$ for which exactly k of the quadrilaterals $A_i A_{i+1} A_{i+2} A_{i+3}$ have an inscribed circle. (Here $A_{n+j} = A_j$.)

Why Astronomy is better than Sex:

You don't have to compliment the person that gave you a view

Why pi is inferior to e

'e' is the most commonly picked vowel in Wheel of Fortune.

Why e is inferior to pi

PI is the bigger piece of pie

"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 BRACHE

"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