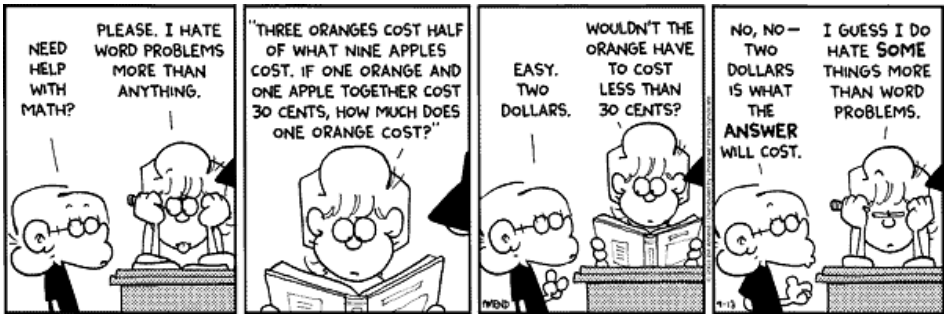
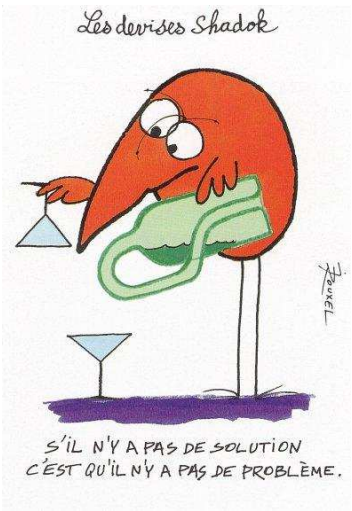
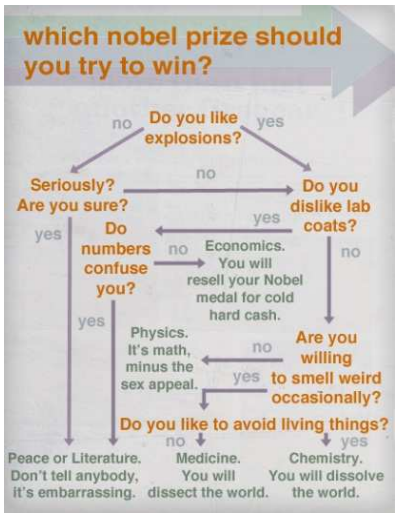
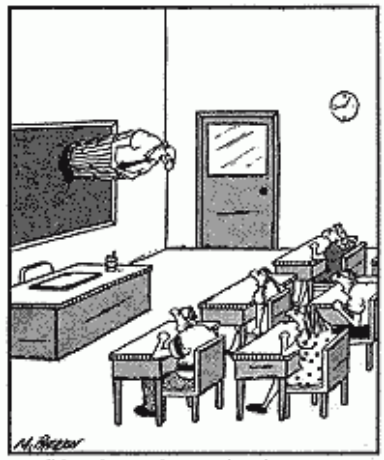
$$x^4-8220x^3+25336190x^2-34705209900x+17825663367369=0$$








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

	1	T	(1803) Guglielmo Libri Carucci dalla Sommaja (1878) Agner Krarup Erlang (1894) Satyendranath Bose (1912) Boris Gnedenko	RM132
	2	W	(1822) Rudolf Julius Emmanuel Clausius (1905) Lev Genrichovich Shnirelman (1938) Anatoly Samoilenko	
	3	T	(1917) Yuri Alexeievich Mitropolsky	
	4	F	(1643) Isaac Newton	RM071
	5	S	(1723) Nicole-Reine Etable de Labrière Lepaute (1838) Marie Ennemond Camille Jordan (1871) Federigo Enriques (1871) Gino Fano	RM084
	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	RM156
	9	W	(1864) Vladimir Adreievich Steklov (1915) Mollie Orshansky	
	10	T	(1875) Issai Schur (1905) Ruth Moufang	
	11	F	(1545) Guidobaldo del Monte (1707) Vincenzo Riccati (1734) Achille Pierre Dionis du Sejour	RM120
	12	S	(1906) Kurt August Hirsch (1915) Herbert Ellis Robbins	RM156
	13	S	(1864) Wilhelm Karl Werner Otto Fritz Franz Wien (1876) Luther Pfahler Eisenhart (1876) Erhard Schmidt (1902) Karl Menger	
3	14	M	(1902) Alfred Tarski	RM096
	15	T	(1704) Johann Castillon (1717) Mattew Stewart (1850) Sofia Vasilievna Kovalevskaja	RM144
	16	W	(1801) Thomas Klausen	
	17	T	(1647) Catherina Elisabetha Koopman Hevelius (1847) Nikolay Egorovich Zukowsky (1858) Gabriel Koenigs	
	18	F	(1856) Luigi Bianchi (1880) Paul Ehrenfest	
	19	S	(1813) Rudolf Friedrich Alfred Clebsch (1879) Guido Fubini (1908) Aleksandr Gennadievich Kurosh	
	20	S	(1775) André Marie Ampère (1895) Gabor Szegő (1904) Renato Caccioppoli	RM072
4	21	M	(1846) Pieter Hendrik Schoute (1915) Yuri Vladimirovich Linnik	
	22	T	(1592) Pierre Gassendi (1886) John William Navin Sullivan (1908) Lev Davidovich Landau	RM063
	23	W	(1840) Ernst Abbe (1862) David Hilbert	RM060
	24	T	(1891) Abram Samoilovitch Besicovitch (1914) Vladimir Petrovich Potapov	
	25	F	(1627) Robert Boyle (1736) Joseph-Louis Lagrange (1843) Karl Hermann Amandus Schwarz	RM048
	26	S	(1799) Benoît Paul Émile Clapeyron (1862) Eliakim Hastings Moore	
	27	S	(1832) Charles Lutwidge Dodgson	RM108
5	28	M	(1701) Charles Marie de La Condamine (1888) Louis Joel Mordell (1892) Carlo Emilio Bonferroni	
	29	T	(1817) William Ferrel (1888) Sidney Chapman	
	30	W	(1619) Michelangelo Ricci	
	31	T	(1715) Giovanni Francesco Fagnano dei Toschi (1841) Samuel Loyd (1896) Sofia Alexandrovna Janowskaja (1945) Persi Warren Diaconis	

Rudi Mathematici

January

Putnam 1998-A1

A right circular cone has base of radius 1 and height 3. A cube is inscribed in the cone so that one face of the cube is contained in the base of the cone. What is the side-length of the cube?

Scientists and Light Bulbs

How many general relativists does it take to change a light bulb?
Two. One holds the bulb, while the other rotates the universe.

Mathematical Nursery Rhymes (Graham)

Fiddle de dum, fiddle de dee
A ring round the Moon is π times D
But if a hole you want repaired
You use the formula πr^2

*The future science of government should be called "la cybernétique" (*1843*).*

André Marie Ampère

Father of Chemistry and Uncle of the Earl of Cork [On his tombstone]

Robert Boyle

The different branches of Arithmetic – Ambition, Distraction, Uglification, and Derision.

Charles Lutwidge Dodgson

The way I do magic is very similar to mathematics. Inventing a magic trick and inventing a theorem are very, very similar activities in the following sense. In both subjects you have a problem you're trying to solve with constraints. One difference between magic and mathematics is the competition. The competition in mathematics is a lot stiffer than in magic.

Persi Warren Diaconis

How thoroughly it is ingrained in mathematical science that every real advance goes hand in hand with the invention of sharper tools and simpler methods which, at the same time, assist in understanding earlier theories and in casting aside some more complicated developments.

David Hilbert

Mathematics, as much as music or any other art, is one of the means by which we rise to a complete self-consciousness. The significance of mathematics resides precisely in the fact that it is an art; by informing us of the nature of our own minds it informs us of much that depends on our minds.

John William Navin Sullivan

	1	F	(1900) John Charles Burkill	
	2	S	(1522) Lodovico Ferrari (1893) Cornelius Lanczos (1897) Gertrude Blanch	
	3	S	(1893) Gaston Maurice Julia	RM073
6	4	M	(1905) Eric Cristopher Zeeman	
	5	T	(1757) Jean Marie Constant Duhamel	
	6	W	(1465) Scipione del Ferro (1612) Antoine Arnauld (1695) Nicolaus (II) Bernoulli	RM064 RM093
	7	T	(1877) Godfried Harold Hardy (1883) Eric Temple Bell	RM049
	8	F	(1700) Daniel Bernoulli (1875) Francis Ysidro Edgeworth (1928) Ennio de Giorgi	RM093 RM133
	9	S	(1775) Farkas Wolfgang Bolyai (1907) Harold Scott Macdonald Coxeter	 RM097
	10	S	(1747) Aida Yasuaki (1932) Vivienne Malone-Mayes	RM121
7	11	M	(1657) Bernard Le Bovier de Fontenelle (1800) William Henry Fox Talbot (1839) Josiah Willard Gibbs (1915) Richard Wesley Hamming	
	12	T	(1914) Hanna Caemmerer Neumann (1921) Kathleen Rita Mcnulty Mauchly Antonelli	
	13	W	(1805) Johann Peter Gustav Lejeune Dirichlet	RM145
	14	T	(1468) Johann Werner (1849) Hermann Hankel (1877) Edmund Georg Hermann Landau (1896) Edward Artur Milne	 RM063
	15	F	(1564) Galileo Galilei (1850) Sophie Willock Bryant (1861) Alfred North Whitehead (1946) Douglas Hofstadter	RM085
	16	S	(1822) Francis Galton (1853) Gregorio Ricci-Curbastro (1903) Beniamino Segre	
	17	S	(1890) Sir Ronald Aylmer Fisher (1891) Adolf Abraham Halevi Fraenkel (1905) Rózsa Péter	
8	18	M	(1404) Leon Battista Alberti (1919) Clifford Truesdell	RM157
	19	T	(1473) Nicolaus Copernicus	
	20	W	(1844) Ludwig Boltzmann	RM061
	21	T	(1591) Girard Desargues (1915) Evgeny Michailovich Lifshitz	
	22	F	(1857) Heinrich Rudolf Hertz (1903) Frank Plumpton Ramsey	
	23	S	(1583) Jean-Baptiste Morin (1922) Anneli Cahn Lax (1951) Shigefumi Mori	
	24	S	(1871) Felix Bernstein	
9	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		(1860) Herman Hollerith	RM109

February

Putnam 1997-A2

Let s be any arc of the unit circle lying entirely in the first quadrant. Let A be the area of the region lying below s and above the x-axis and let B be the area of the region lying to the right of the y-axis and to the left of s. Prove that $A+B$ depends only on the arc length, and not on the position, of s.

Scientists and Light Bulbs

How many quantum physicists does it take to change a light bulb?
One. Two to do it, and one to renormalise the wave function.

Mathematical Nursery Rhymes (Graham)

Rock-a-bye baby in the tree top
As a compound pendulum, you are a flop.
Your center of percussion is safe and low,
As one may see when wind doth blow.
Your frequency of vibration is quite small,
Frankly, I don't think you'll fall at all.

Wherever groups disclosed themselves, or could be introduced, simplicity crystallized out of comparative chaos.

Eric Temple Bell

Abstractness, sometimes hurled as a reproach at mathematics, is its chief glory and its surest title to practical usefulness. It is also the source of such beauty as may spring from mathematics.

Eric Temple Bell

I think that the origin of creativity in all fields is that which I call the capacity or disposition to dream: to imagine different worlds, different things, and to seek to combine them in one's imagination in various ways.

Ennio De Giorgi

To call in the statistician after the experiment is done may be no more than asking him to perform a post-mortem examination: he may be able to say what the experiment died of.

Sir Ronald Aylmer Fisher

The mathematician's patterns, like the painter's or the poet's must be beautiful; the ideas, like the colours or the words must fit together in a harmonious way. Beauty is the first test: there is no permanent place in this world for ugly mathematics.

Godfried Harold Hardy

	1	F	(1611) John Pell (1879) Robert Daniel Carmichael
	2	S	(1836) Julius Weingarten
	3	S	(1838) George William Hill (1845) Georg Cantor RM062 (1916) Paul Richard Halmos
10	4	M	(1822) Jules Antoine Lissajous
	5	T	(1512) Gerardus Mercator (1759) Benjamin Gompertz (1817) Angelo Genocchi (1885) Pauline Sperry
	6	W	(1866) Ettore Bortolotti
	7	T	(1792) William Herschel RM146 (1824) Delfino Codazzi (1922) Olga Alexandrovna Ladyzhenskaya
	8	F	(1851) George Chrystal
	9	S	(1818) Ferdinand Joachimsthal (1900) Howard Hathaway Aiken
	10	S	(1864) William Fogg Osgood (1872) Mary Ann Elizabeth Stephansen
11	11	M	(1811) Urbain Jean Joseph Le Verrier (1853) Salvatore Pincherle (1870) Louis Bachelier RM158
	12	T	(1685) George Berkeley (1824) Gustav Robert Kirchhoff (1859) Ernesto Cesaro
	13	W	(1861) Jules Joseph Drach (1957) Rudy D'Alembert
	14	T	(1864) Jozef Kurschak (1879) Albert Einstein RM074 (1904) Lyudmila Vsevolodovna Keldysh
	15	F	(1860) Walter Frank Raphael Weldon (1868) Grace Chisolm Young
	16	S	(1750) Caroline Herschel RM146 (1789) Georg Simon Ohm (1846) Magnus Gosta Mittag-Leffler
	17	S	(1876) Ernest Benjamin Esclangon (1897) Charles Fox
12	18	M	(1640) Philippe de La Hire (1690) Christian Goldbach RM122 (1796) Jacob Steiner (1870) Agnes Sime Baxter
	19	T	(1862) Adolf Kneser (1910) Jacob Wolfowitz
	20	W	(1840) Franz Mertens (1884) Philip Franck (1938) Sergi Petrovich Novikov
	21	T	(1768) Jean Baptiste Joseph Fourier (1884) George David Birkhoff
	22	F	(1891) Lorna Mary Swain (1917) Irving Kaplansky (1944) Margaret Hilary Ashworth Millington
	23	S	(1754) Georg Freiherr von Vega (1882) Emmy Amalie Noether RM050 (1897) John Lighton Synge
	24	S	(1809) Joseph Liouville (1948) Sun-Yung (Alice) Chang (1966) Gigliola Staffilani RM142
13	25	M	(1538) Christopher Clausius
	26	T	(1848) Konstantin Andreev (1913) Paul Erdős RM110
	27	W	(1857) Karl Pearson
	28	T	(1749) Pierre-Simon de Laplace (1928) Alexander Grothendieck RM086
	29	F	(1825) Francesco Faa' Di Bruno (1873) Tullio Levi-Civita RM098 (1896) Wilhelm Ackerman
	30	S	(1892) Stefan Banach RM134 (1921) Alfréd Rényi
	31	S	(1596) René Descartes

March

Putnam, 1998, A-3

Let f be a real function on the real line with continuous third derivative. Prove that there exists a point a such that $f(a)\cdot f'(a)\cdot f''(a)\cdot f'''(a)\geq 0$.

Scientists and Light Bulbs

How many quantum mechanicians does it take to change a light bulb?
They can't. If they know where the socket is, they cannot locate the new bulb.

Mathematical Nursery Rhymes (Graham)

Ride a fast plane
And don't spare the cash,
To see the math wizard do sums in a flash.
Roots on his fingers
And power on his toes –
He carry log tables
Whenever he goes.

Numbers written on restaurant bills within the confines of restaurants do not follow the same mathematical laws as numbers written on any other pieces of paper in any other parts of the Universe.

This single statement took the scientific world by storm. It completely revolutionized it. So many mathematical conferences got held in such good restaurants that many of the finest minds of a generation died of obesity and heart failure and the science of math was put back by years.

Douglas Adams

Number…is nothing fixed and settled, really existing in things themselves. It is entirely the creation of the mind… We call a window one, a chimney one, and yet a house, in which there are many windows and chimneys, has an equal right to be called one, and many houses go into the making of one city.

George Berkeley

In particular, in the introduction of new numbers, it is only obligated to give definitions of them which will bestow such a determinacy and, in certain circumstances, such a relationship to the other numbers that they can in any given instance be precisely distinguished. As soon as a number satisfies all these conditions, it can and must be regarded in mathematics as existent and real.

Georg Cantor

A thing is obvious mathematically after you see it.

Robert Daniel Carmichael

Each problem that I solved became a rule which served afterwards to solve other problems.

René Descartes

April

14	1	M	(1640) Georg Mohr (1776) Marie-Sophie Germain (1895) Alexander Craig Aitken
	2	T	(1878) Edward Kasner (1934) Paul Joseph Cohen
	3	W	(1835) John Howard Van Amringe (1892) Hans Rademacher (1909) Stanislaw Marcin Ulam (1971) Alice Riddle
	4	T	(1809) Benjamin Peirce RM123 (1842) Francois Edouard Anatole Lucas (1949) Shing-Tung Yau
	5	F	(1588) Thomas Hobbes (1607) Honoré Fabri (1622) Vincenzo Viviani (1869) Sergi Alexeievich Chaplygin
	6	S	(1801) William Hallowes Miller
	7	S	(1768) François-Joseph Français
15	8	M	(1903) Marshall Harvey Stone
	9	T	(1791) George Peacock (1816) Charles Eugene Delaunay (1894) Cypra Cecilia Krieger Dunaij (1919) John Presper Heckert
	10	W	(1857) Henry Ernest Dudeney
	11	T	(1953) Andrew John Wiles
	12	F	(1794) Germinal Pierre Dandelin (1852) Carl Louis Ferdinand von Lindemann (1903) Jan Tinbergen
	13	S	(1728) Paolo Frisi (1813) Duncan Farquharson Gregory (1869) Ada Isabel Maddison (1879) Francesco Severi
	14	S	(1629) Christiaan Huygens RM135
16	15	M	(1452) Leonardo da Vinci (1548) Pietro Antonio Cataldi (1707) Leonhard Euler RM051 (1809) Herman Gunther Grassmann
	16	T	(1682) John Hadley (1823) Ferdinand Gotthold Max Eisenstein
	17	W	(1798) Etienne Bobillier (1853) Arthur Moritz Schonflies (1863) Augustus Edward Hough Love
	18	T	(1791) Ottaviano Fabrizio Mossotti RM150 (1907) Lars Valerian Ahlfors (1918) Hsien Chung Wang (1949) Charles Louis Fefferman
	19	F	(1880) Evgeny Evgenievich Slutsky (1883) Richard von Mises (1901) Kiyoshi Oka (1905) Charles Ehresmann
	20	S	(1839) Francesco Siacci
	21	S	(1652) Michel Rolle (1774) Jean Baptiste Biot (1875) Teiji Takagi
17	22	M	(1811) Otto Ludwig Hesse (1887) Harald August Bohr RM063 (1935) Bhama Srinivasan (1939) Sir Michael Francis Atiyah
	23	T	(1858) Max Karl Ernst Ludwig Planck (1910) Sheila Scott Macintyre
	24	W	(1863) Giovanni Vailati (1899) Oscar Zariski RM099
	25	T	(1849) Felix Christian Klein (1900) Wolfgang Pauli (1903) Andrei Nicolayevich Kolmogorov RM159
	26	F	(1889) Ludwig Josef Johan Wittgenstein
	27	S	(1755) Marc-Antoine Parseval des Chenes (1932) Gian-Carlo Rota
	28	S	(1906) Kurt Godel RM087
18	29	M	(1854) Jules Henri Poincarè RM075
	30	T	(1777) Johann Carl Friedrich Gauss RM147 (1916) Claude Elwood Shannon RM111

Putnam, 1998, A-4

Let $A_1=0$ and $A_2=1$. For $n>2$, the number A_n is defined by concatenating the decimal expansions of A_{n-1} and A_{n-2} from left to right. For example $A_3=A_2A_1=10$, $A_4=A_3A_2=101$, $A_5=A_4A_3=10110$, and so forth. Determine all n such that A_n divides 11.

Scientists and Light Bulbs

How many astronomers does it take to change a light bulb?
None, astronomers prefer the dark.

Mathematical Nursery Rhymes (Graham)

Little Bo-Beep has lost her sheep,
Totalling 10100.
She counted by twos, meaning fewer to lose,
But we trust that all the twenty get caught.

The mathematics (…) charm the passions, restrain the impetuosity of imagination, and purge the mind from error and prejudice.

John Arbuthnot

Now I will have less distraction. [Upon losing the use of his right eye].

Leonhard Euler

If others would but reflect on mathematical truths as deeply and continuously as I have, they would make my discoveries.

Johann Carl Friedrich Gauss

As to problems with the answer Yes or No, the conviction that they are always decidable remains untouched by these results.

Kurt Godel

There is more in Mersenne than in all the universities together.

Thomas Hobbes

He who loves practice without theory is like the sailor who boards ship without a rudder and compass and never knows where he may cast.

Leonardo Da Vinci

We often hear that mathematics consists mainly of "proving theorems." Is a writer's job mainly that of "writing sentences?".

Gian-Carlo ROTA

	1	W	(1825) Johann Jacob Balmer (1908) Morris Kline	RM122
	2	T	(1860) D'Arcy Wentworth Thompson (1905) Kazimierz Zarankiewitz	RM138
	3	F	(1842) Otto Stolz (1860) Vito Volterra (1892) George Paget Thomson	 RM136 RM161
	4	S	(1845) William Kingdon Clifford	
	5	S	(1833) Lazarus Emmanuel Fuchs (1883) Anna Johnson Pell Wheeler (1897) Francesco Giacomo Tricomi (1923) Cathleen Synge Morawetz	
19	6	M	(1872) Willem de Sitter (1906) André Weil	 RM088
	7	T	(1854) Giuseppe Veronese (1881) Ebenezer Cunningham (1896) Pavel Sergieievich Alexandrov (1926) Alexis Claude Clairaut	
	8	W	(1859) Johan Ludwig William Valdemar Jensen (1905) Winifred Lydia Caunden Sargent	
	9	T	(1746) Gaspard Monge (1876) Gilbert Ames Bliss (1965) Karen Ellen Smith	
	10	F	(1788) Augustin Jean Fresnel (1847) William Karl Joseph Killing (1904) Edward James Mcshane (1958) Piotr Rezierovich Silverbrahms	
	11	S	(1902) Edna Ernestine Kramer Lassar (1918) Richard Phillips Feynman	 RM076
	12	S	(1820) Florence Nightingale (1845) Pierre René Jean Baptiste Henry Brocard (1902) Frank Yates	RM104
20	13	M	(1750) Lorenzo Mascheroni (1899) Pelageia Yakovlevna Polubarinova Kochina	
	14	T	(1832) Rudolf Otto Sigismund Lipschitz (1863) John Charles Fields	 RM100
	15	W	(1939) Brian Hartley (1964) Sijue Wu	
	16	T	(1718) Maria Gaetana Agnesi (1821) Pafnuti Lvovi Chebyshev (1911) John (Jack) Todd	RM112 RM139
	17	F	(1940) Alan Kay	
	18	S	(1850) Oliver Heaviside (1892) Bertrand Arthur William Russell	RM160 RM052
	19	S	(1865) Flora Philip (1919) Georgii Dimitirievich Suvorov	
21	20	M	(1861) Henry Seely White	
	21	T	(1471) Albrecht Dürer (1792) Gustave Gaspard de Coriolis	RM124
	22	W	(1865) Alfred Cardew Dixon	
	23	T	(1914) Lipa Bers	RM148
	24	F	(1544) William Gilbert	
	25	S	(1838) Karl Mikailovich Peterson	
	26	S	(1667) Abraham de Moivre (1896) Yuri Dimitrievich Sokolov	
22	27	M	(1862) John Edward Campbell	
	28	T	(1676) Jacopo Francesco Riccati (1710) Johann (II) Bernoulli	 RM093
	29	W	(1882) Harry Bateman	
	30	T	(1814) Eugene Charles Catalan	
	31	F	(1926) John Kemeny	

May

Putnam, 1998, A-5

Let F be a finite collection of open discs in $\Re^2$ whose union contains a set $E \subseteq \Re^2$. Show that there is a pairwise disjoint subcollection $D_1,\ldots D_n$ in F such that $E \subseteq \bigcup_{j=1}^{n} 3D_j$. Here, if D is the disc of radius r and center P, then $3D$ is the disc of radius $3r$ and center P.

Scientists and Light Bulbs

How many radio astronomers does it take to change a light bulb?
None. They are not interested in that short wave stuff.

Mathematical Nursery Rhymes (Graham)

A diller, a dollar,
A witless trig scholar,
On a ladder against a wall.
If length over height
Gives an ancle too slight,
The cosecant may provide his downfall.

The fact that I beat a drum has nothing to do with the fact that I do theoretical physics. Theoretical physics is a human endeavor, one of the higher developments of human beings - and this perpetual desire to prove that people who do it are human by showing that they do other things that a few other humans do (like playing bongo drums) is insulting to me.

Richard Phillips Feynman

Mathematics is a grand and vast landscape open to all men to whom thinking brings joy, but not very suitable for those who do not like the trouble of thinking.

Lazarus Emmanuel Fuchs

Statistics: the mathematical theory of ignorance.

Morris Kline

There are in this world optimists who feel that any symbol that starts off with an integral sign must necessarily denote something that will have every property that they should like an integral to possess. This of course is quite annoying to us rigorous mathematicians; what is even more annoying is that by doing so they often come up with the right answer.

Edward James McShane

At the age of eleven, I began Euclid, with my brother as my tutor. This was one of the great events of my life, as dazzling as first love. I had not imagined there was anything so delicious in the world. From that moment until I was thirty-eight, mathematics was my chief interest and my chief source of happiness.

Bertrand Arthur William Russell

	1	S	(1796) Sadi Leonard Nicolas Carnot (1851) Edward Bailey Elliott (1899) Edward Charles Titchmarsh
	2	S	(1895) Tibor Radó
23	3	M	(1659) David Gregory
	4	T	(1809) John Henry Pratt (1966) Svetlana Yakovlevna Jitomirskaya
	5	W	(1814) Pierre Laurent Wantzel RM065 (1819) John Couch Adams (1883) John Maynard Keynes
	6	T	(1436) Johann Muller Regiomontanus (1857) Aleksandr Michailovitch Lyapunov RM077 (1906) Max Zorn
	7	F	(1863) Edward Burr Van Vleck
	8	S	(1625) Giovanni Domenico Cassini (1858) Charlotte Angas Scott (1860) Alicia Boole Stott (1924) Samuel Karlin
	9	S	(1885) John Edensor Littlewood RM049
24	10	M	(940) Mohammad Abu'L Wafa Al-Buzjani (1887) Vladimir Ivanovich Smirnov RM101
	11	T	(1881) Hilda Phoebe Hudson (1937) David Bryant Mumford
	12	W	(1888) Zygmunt Janyszewski (1937) Vladimir Igorevich Arnold
	13	T	(1831) James Clerk Maxwell RM113 (1872) Jessie Chrystal Macmillan (1876) William Sealey Gosset (Student) (1928) John Forbes Nash RM149
	14	F	(1736) Charles Augustin de Coulomb (1856) Andrei Andreyevich Markov RM125 (1903) Alonzo Church
	15	S	(1640) Bernard Lamy (1894) Nikolai Gregorievich Chebotaryov
	16	S	(1915) John Wilder Tukey
25	17	M	(1898) Maurits Cornelius Escher RM097
	18	T	(1858) Andrew Russell Forsyth (1884) Charles Ernest Weatherburn (1884) Frieda Nugel (1913) Paul Teichmueller RM148
	19	W	(1623) Blaise Pascal RM053 (1902) Wallace John Eckert
	20	T	(1873) Alfred Loewy (1917) Helena Rasiowa
	21	F	(1781) Simeon Denis Poisson (1828) Giuseppe Bruno
	22	S	(1822) Mario Pieri (1864) Hermann Minkowsky (1910) Konrad Zuse (1932) Mary Wynne Warner
	23	S	(1912) Alan Mathison Turing RM089
26	24	M	(1880) Oswald Veblen
	25	T	(1908) William Van Orman Quine
	26	W	(1823) William Thomson, Lord Kelvin RM161 (1918) Yudell Leo Luke
	27	T	(1806) Augustus de Morgan
	28	F	(1875) Henri Leon Lebesgue
	29	S	(1888) Aleksandr Aleksandrovich Friedmann RM101
	30	S	(1791) Felix Savart (1958) Abigail A Thompson

June

Putnam, 1998, A-6

Let *A*, *B*, *C* denote distinct points with integer coordinates in $\Re^2$. Prove that if

$$\left(|AB|+|BC|\right)^2 < 8\cdot[ABC]+1$$

then *A*, *B*, *C* are three vertices of a square. Here $|XY|$ is the length of segment *XY* and [*ABC*] is the area of triangle *ABC*.

Scientists and Light Bulbs

How many evolutionists does it take to change a light bulb?
Only one, but it takes eight million years.

Mathematical Nursery Rhymes (Graham)

Where are going to, my pretty maid?
I'm going a-milking, sir, she said.
How many gallons to drink when you're done?
Divide cubic inches by 231.

Mathematics is the branch of Physics where experiments are cheap.

Vladimir Igorevich Arnold

Every science that has thriven has thriven upon its own symbols: logic, the only science which is admitted to have made no improvements in century after century, is the only one which has grown no symbols.

Augustus De Morgan

Mathematics is the science which uses easy words for difficult ideas.

E. Kasner, J.R. Newman

When the facts change, I change my mind. What do you do, sir?

John Maynard Keynes

The infinitely competent can be uncreative.

John Edensor Littlewood

Look somewhere else for someone who can follow you in your researches about numbers. For my part, I confess that they are far beyond me, and I am competent only to admire them. [Written to Fermat]

Blaise Pascal

27	**1**	**M**	(1643) Gottfried Wilhelm von Leibniz RM054 (1788) Jean Victor Poncelet (1906) Jean Alexandre Eugène Dieudonné
	2	**T**	(1820) William John Racquorn Rankine (1852) William Burnside (1925) Olga Arsen'evna Oleinik
	3	**W**	(1807) Ernest Jean Philippe Fauque de Jonquiere RM162 (1897) Jesse Douglas
	4	**T**	(1906) Daniel Edwin Rutherford (1917) Michail Samoilovich Livsic
	5	**F**	(1936) James Mirrlees
	6	**S**	(1849) Alfred Bray Kempe
	7	**S**	(1816) Johann Rudolf Wolf (1906) William Feller (1922) Vladimir Aleksandrovich Marchenko
28	**8**	**M**	(1760) Christian Kramp (1904) Henri Paul Cartan RM126
	9	**T**	(1845) George Howard Darwin RM138 (1931) Valentina Mikhailovna Borok
	10	**W**	(1862) Roger Cotes (1868) Oliver Dimon Kellogg
	11	**T**	(1857) Sir Joseph Larmor (1888) Jacob David Tamarkin RM101 (1890) Giacomo Albanese
	12	**F**	(1875) Ernest Sigismund Fischer (1895) Richard Buckminster Fuller RM066 (1935) Nicolas Bourbaki RM126
	13	**S**	(1527) John Dee (1741) Karl Friedrich Hindenburg
	14	**S**	(1671) Jacques D'Allonville (1793) George Green RM078
29	**15**	**M**	(1865) Wilhelm Wirtinger (1898) Mary Taylor Slow (1906) Adolph Andrej Pavlovich Yushkevich
	16	**T**	(1678) Jakob Hermann (1903) Irmgard Flugge-Lotz
	17	**W**	(1831) Victor Mayer Amedeè Mannheim (1837) Wilhelm Lexis (1944) Krystyna Maria Trybulec Kuperberg
	18	**T**	(1013) Hermann von Reichenau (1635) Robert Hooke RM114 (1853) Hendrik Antoon Lorentz RM161
	19	**F**	(1768) Francois Joseph Servois
	20	**S**	(1876) Otto Blumenthal (1947) Gerd Binnig
	21	**S**	(1620) Jean Picard (1848) Emil Weyr (1849) Robert Simpson Woodward (1861) Herbert Ellsworth Slaught
30	**22**	**M**	(1784) Friedrich Wilhelm Bessel
	23	**T**	(1775) Etienne Louis Malus (1854) Ivan Slezynsky
	24	**W**	(1851) Friedrich Herman Schottky (1871) Paul Epstein (1923) Christine Mary Hamill
	25	**T**	(1808) Johann Benedict Listing
	26	**F**	(1903) Kurt Mahler
	27	**S**	(1667) Johann Bernoulli RM093 (1801) George Biddel Airy (1848) Lorand Baron von Eötvös (1871) Ernst Friedrich Ferdinand Zermelo RM090
	28	**S**	(1954) Gerd Faltings
31	**29**	**M**	(1898) Isidor Isaac Rabi
	30	**T**	(1889) Vladimir Kosma Zworkyn
	31	**W**	(1704) Gabriel Cramer (1712) Johann Samuel Koenig (1926) Hilary Putnam

July

Putnam, 1998, B-1

Find the minimum value of:

$$\frac{\left(x+\frac{1}{x}\right)^6-\left(x^6+\frac{1}{x^6}\right)-2}{\left(x+\frac{1}{x}\right)^3+\left(x^3+\frac{1}{x^3}\right)}$$

for $x>0$.

Scientists and Light Bulbs

How many academics does it take to change a light bulb?
None. That is what their students are for.

Mathematical Nursery Rhymes (Graham)

Sing a song of sixpence –
A mathman full of rye,
Four times twenty square feet,
Multiplied by π
Gives the total ground he covers
While weaving an ellipse;
His path would have no area
If he had no nips.

The architecture of mathematics is like that of a city whose suburbs are continuing to grow, sometimes in a some chaotic way, while the center is periodically rebuilt, each time following a clearer plan and a more majestic order, destroying the old quarters with their maze of narrow streets, to launch towards the periphery increasingly direct avenues, wider and more comfortable.

Nicolas Bourbaki

Everything you've learned in school as 'obvious' becomes less and less obvious as you begin to study the universe. For example, there are no solids in the universe. There's not even a suggestion of a solid. There are no absolute continuums. There are no surfaces. There are no straight lines.

Richard Buckminster Fuller

The imaginary number is a fine and wonderful resource of the human spirit, almost an amphibian between being and not being.

Gottfried Wilhelm von Leibniz

[EH] Moore was presenting a report in a circle on a very technical subject. In the middle of the seminar he discovered what appeared to be a mistake (though probably no one else in the room had noticed). He stopped and re-worked the dubious step for a few minutes and then, convinced of the error, suddenly closed the conference - to the dismay of many in the audience. It was evidence of intellectual courage, as well as honesty, and no doubt won him the supreme admiration of every person in the group - an admiration that was not at all diminished, but rather increased, when at a later meeting he announced that he was finally able to prove that the step was correct.

Herbert Ellsworth Slaught

	1	T	(1861) Ivar Otto Bendixson (1881) Otto Toeplitz (1955) Bernadette Perrin-Riou
	2	F	(1856) Ferdinand Rudio (1902) Mina Spiegel Rees
	3	S	(1914) Mark Kac RM115
	4	S	(1805) Sir William Rowan Hamilton RM079 (1838) John Venn
32	5	M	(1802) Niels Henrik Abel RM055 (1941) Alexander Keewatin Dewdney
	6	T	(1638) Nicolas Malebranche (1741) John Wilson
	7	W	(1868) Ladislaus Josephowitsch Bortkiewitz
	8	T	(1902) Paul Adrien Maurice Dirac RM103 (1931) Sir Roger Penrose
	9	F	(1537) Francesco Barozzi (Franciscus Barocius) (1940) Linda Goldway Keen
	10	S	(1602) Gilles Personne de Roberval (1926) Carol Ruth Karp
	11	S	(1730) Charles Bossut (1842) Enrico D'Ovidio
33	12	M	(1882) Jules Antoine Richard (1887) Erwin Rudolf Josef Alexander Schrödinger RM103
	13	T	(1625) Erasmus Bartholin (1819) George Gabriel Stokes (1861) Cesare Burali-Forti
	14	W	(1530) Giovanni Battista Benedetti (1842) Jean Gaston Darboux (1865) Guido Castelnuovo (1866) Charles Gustave Nicolas de La Vallée-Poussin
	15	T	(1863) Aleksei Nikolaevich Krylov (1892) Louis Pierre Victor Duc de Broglie (1901) Piotr Sergeevich Novikov
	16	F	(1773) Louis-Benjamin Francoeur (1821) Arthur Cayley
	17	S	(1601) Pierre de Fermat RM091
	18	S	(1685) Brook Taylor
34	19	M	(1646) John Flamsteed (1739) Georg Simon Klugel
	20	T	(1710) Thomas Simpson (1863) Corrado Segre (1882) Wacław Sierpiński
	21	W	(1789) Augustin Louis Cauchy RM127
	22	T	(1647) Denis Papin
	23	F	(1683) Giovanni Poleni (1829) Moritz Benedikt Cantor (1842) Osborne Reynolds
	24	S	(1561) Bartholomeo Pitiscus (1942) Karen Keskulla Uhlenbeck RM163
	25	S	(1561) Philip Van Lansberge (1844) Thomas Muir
35	26	M	(1728) Johann Heinrich Lambert (1875) Giuseppe Vitali (1965) Marcus Peter Francis du Sautoy
	27	T	(1858) Giuseppe Peano RM067
	28	W	(1796) Irénée Jules Bienaymé
	29	T	(1904) Leonard Roth
	30	F	(1856) Carle David Tolmé Runge (1906) Olga Taussky-Todd RM139
	31	S	(1821) Hermann Ludwig Ferdinand von Helmholtz (1885) Herbert Westren Turnbull

Rudi Mathematici

August

Putnam, 1998, B-2

Given a point (a,b) with $0<b<a$, determine the minimum perimeter of a triangle with one vertex at (a,b), one on the x-axis, and one on the line $y=x$. You may assume that a triangle of minimum perimeter exists.

Scientists and Light Bulbs

How many mathematicians does it take to screw in a light bulb?
None. It's left to the reader as an exercise.

Mathematical Nursery Rhymes (Graham)

Hey diddle, diddle,
The cat and the fiddle,
The cow jumped into the blue;
Her leap into action
Took plenty of traction
The product of Force times mew.

[About Gauss' mathematical writing style]: He is like the fox, who effaces his tracks in the sand with his tail.
Niels Henrik Abel

From the age of ancient Greece to the late nineteenth century, mathematicians and philosophers - not to mention the myriad of amateur enthusiasts - thought the squaring of the circle was a difficult, but not impossible problem. Many, in fact, have supposed that mathematicians had expressed a specific pathology. The main symptoms of this disease called morbus cyclometricus, are blurred vision, insomnia, numerous jabs (caused by the slipping of the compass) and, of course, circles under the eyes. There is no known cure.
Alexander Keewatin Dewdney

I regard it as an inelegance, or imperfection, in quaternions, or rather in the state to which it has been hitherto unfolded, whenever it becomes or seems to become necessary to have recourse to x, y, z, etc..
Sir William Rowan Hamilton

If there were incomputable things, the concept of computability would not have much interest in mathematics: mathematicians, after all, love puzzles.
Sir Roger Penrose

	1	S	(1659) Joseph Saurin (1835) William Stanley Jevons
36	2	M	(1878) Mauriche René Frechet (1923) René Thom RM080
	3	T	(1814) James Joseph Sylvester RM104 (1884) Solomon Lefschetz (1908) Lev Semenovich Pontryagin
	4	W	(1809) Luigi Federico Menabrea RM150
	5	T	(1667) Giovanni Girolamo Saccheri RM128 (1725) Jean Etienne Montucla
	6	F	(1859) Boris Jakovlevich Bukreev (1863) Dimitri Aleksandrovich Grave
	7	S	(1707) George Louis Leclerc Comte de Buffon (1948) Cheryl Elisabeth Praeger (1955) Efim Zelmanov
	8	S	(1584) Gregorius Saint-Vincent (1588) Marin Mersenne RM092
37	9	M	(1860) Frank Morley (1914) Marjorie Lee Browne
	10	T	(1839) Charles Sanders Peirce RM123
	11	W	(1623) Stefano degli Angeli (1798) Franz Ernst Neumann (1877) Sir James Hopwood Jeans
	12	T	(1891) Antoine André Louis Reynaud (1900) Haskell Brooks Curry (1894) Dorothy Maud Wrinch
	13	F	(1873) Constantin Carathéodory (1885) Wilhelm Johann Eugen Blaschke
	14	S	(1858) Henry Burchard Fine (1891) Ivan Matveevich Vinogradov
	15	S	(973) Abu Arrayhan Muhammad Ibn Ahmad Al'Biruni RM164 (1886) Paul Pierre Levy
38	16	M	(1494) Francisco Maurolico (1736) Johann Nikolaus Tetens
	17	T	(1743) Marie Jean Antoine Nicolas de Caritat de Condorcet (1826) Georg Friedrich Bernhard Riemann RM068
	18	W	(1752) Adrien Marie Legendre RM140
	19	T	(1749) Jean Baptiste Delambre
	20	F	(1842) Alexander Wilhelm von Brill (1861) Frank Nelson Cole
	21	S	(1899) Juliusz Pawel Schauder (1917) Phyllis Nicolson
	22	S	(1765) Paolo Ruffini RM116 (1769) Louis Puissant (1803) Jaques Charles Francois Sturm
39	23	M	(1768) William Wallace (1900) David Van Dantzig
	24	T	(1501) Girolamo Cardano RM064 (1801) Michail Vasilevich Ostrogradski RM056 (1862) Winifred Edgerton Merrill (1945) Ian Nicholas Stewart
	25	W	(1819) George Salmon (1888) Stefan Mazurkiewicz
	26	T	(1688) Willem Jakob 's Gravesande (1854) Percy Alexander Macmahon (1891) Hans Reichenbach
	27	F	(1855) Paul Émile Appell (1876) Earle Raymond Hedrick (1919) James Hardy Wilkinson
	28	S	(1698) Pierre Louis Moreau de Maupertuis RM152 (1761) Ferdinand Francois Desirè Budan de Boislaurent (1873) Julian Lowell Coolidge
	29	S	(1561) Adriaan Van Roomen (1812) Adolph Gopel
40	30	M	(1775) Robert Adrain (1829) Joseph Wolstenholme (1883) Ernst Hellinger

September

Putnam, 1998, B-3

Let H be the unit hemisphere $\{(x,y,z): x^2+y^2+z^2=1, z\geq 0\}$, N the unit $\{(x,y,0): x^2+y^2=1\}$, and P the regular pentagon inscribed in N. Determine the surface area of that portion of H lying over the planar region inside P, and write your answer in the form $A\sin\alpha + B\cos\beta$, where $A,B,\alpha,\beta\in\Re$.

Scientists and Light Bulbs

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

$1\pm 3\ (\alpha = 0.05)$.

Mathematical Nursery Rhymes (Graham)

Little Jack Horner sat in a corner
Trying to evaluate π.
He disdained rule of thumb,
Found an infinite sum,
And exclaimed "It's REAL, nary an i."

Combinatorics is the art of counting things without actually counting them.

Jack Cohen, Terry Pratchett, Ian Stewart

Each triangle (both acute rectangle or equilateral) has a spiritual perfume. Comparing it to other shapes this fragrance is differentiang, getting nuances, but remains fundamentally immutable, like the scent of the rose which cannot be confused with the one of violets.

Michele Emmer

It is clear that Economics, if it is to be a science at all, must be a mathematical science.

William Stanley Jevons

The pragmatist knows that doubt is an art which has to be acquired with difficulty.

Charles Sanders Peirce

I know, indeed, and can conceive of no pursuit so antagonistic to the cultivation of the oratorical faculty ... as the study of Mathematics. An eloquent mathematician must, from the nature of things, ever remain as rare a phenomenon as a talking fish, and it is certain that the more anyone gives himself up to the study of oratorical effect the less will he find himself in a fit state to mathematicize.

James Joseph Sylvester

	1	T	(1671) Luigi Guido Grandi (1898) Bela Kerekjarto' (1912) Kathleen Timpson Ollerenshaw	
	2	W	(1825) John James Walker (1908) Arthur Erdélyi	
	3	T	(1944) Pierre René Deligne	
	4	F	(1759) Louis Francois Antoine Arbogast (1797) Jerome Savary	
	5	S	(1732) Nevil Maskelyne (1781) Bernhard Placidus Johann Nepomuk Bolzano (1861) Thomas Little Heath	 RM117
	6	S	(1552) Matteo Ricci (1831) Julius Wilhelm Richard Dedekind (1908) Sergei Lvovich Sobolev	RM141 RM081
41	7	M	(1885) Niels Bohr	RM063
	8	T	(1908) Hans Arnold Heilbronn	
	9	W	(1581) Claude Gaspard Bachet de Meziriac (1704) Johann Andrea von Segner (1873) Karl Schwarzschild (1949) Fan Rong K Chung Graham	 RM153 RM110
	10	T	(1861) Heinrich Friedrich Karl Ludwig Burkhardt	
	11	F	(1675) Samuel Clarke (1777) Barnabè Brisson (1881) Lewis Fry Richardson (1910) Cahit Arf	
	12	S	(1860) Elmer Sperry	
	13	S	(1890) Georg Feigl (1893) Kurt Werner Friedrich Reidemeister (1932) John Griggs Thomson	
42	14	M	(1687) Robert Simson (1801) Joseph Antoine Ferdinand Plateau (1868) Alessandro Padoa	
	15	T	(1608) Evangelista Torricelli (1735) Jesse Ramsden (1776) Peter Barlow (1931) Eléna Wexler-Kreindler	RM165
	16	W	(1879) Philip Edward Bertrand Jourdain	
	17	T	(1759) Jacob (II) Bernoulli (1888) Paul Isaac Bernays	RM093
	18	F	(1741) John Wilson (1945) Margaret Dusa Waddington Mcduff	
	19	S	(1903) Jean Frédéric Auguste Delsarte (1910) Subrahmanyan Chandrasekhar	 RM153
	20	S	(1632) Sir Christopher Wren (1863) William Henry Young (1865) Aleksandr Petrovich Kotelnikov	RM105
43	21	M	(1677) Nicolaus (I) Bernoulli (1823) Enrico Betti (1855) Giovan Battista Guccia (1914) Martin Gardner	RM093 RM150 RM129 RM137
	22	T	(1587) Joachim Jungius (1895) Rolf Herman Nevanlinna (1907) Sarvadaman Chowla	
	23	W	(1865) Piers Bohl	
	24	T	(1804) Wilhelm Eduard Weber (1873) Edmund Taylor Whittaker	
	25	F	(1811) Évariste Galois	RM069
	26	S	(1849) Ferdinand Georg Frobenius (1857) Charles Max Mason (1911) Shiing-Shen Chern	
	27	S	(1678) Pierre Remond de Montmort (1856) Ernest William Hobson	
44	28	M	(1804) Pierre François Verhulst	
	29	T	(1925) Klaus Roth	
	30	W	(1906) Andrej Nikolaevich Tichonov (1946) William Paul Thurston	
	31	T	(1711) Laura Maria Catarina Bassi (1815) Karl Theodor Wilhelm Weierstrass (1935) Ronald Lewis Graham	 RM057 RM110

October

Putnam, 1998, B-4
Find necessary and sufficient conditions on positive integers m and n so that

$$\sum_{i=0}^{mn-1}(-1)^{\left\lfloor \frac{i}{m} \right\rfloor + \left\lfloor \frac{i}{n} \right\rfloor} = 0 \cdot$$

Scientists and Light Bulbs

How many graduate students does it take to screw in a light bulb?
Only one, but it may take upwards of five years for him to get it done.

Mathematical Nursery Rhymes (Graham)

RUB-A-DUB-DUB
Three men in a tub
Useful volume a tub must be
Weight of tub plus the fellows
(If you disregard billows)
Over specific weight of the sea.

Biographical history, as taught in our public schools, is still largely a history of boneheads: ridiculous kings and queens, paranoid political leaders, compulsive voyagers, ignorant generals – the flotsam and jetsam of historical currents. The men who radically altered history, the great scientists and mathematicians, are seldom mentioned, if at all.

Martin Gardner

[The works of Archimedes] are without exception, monuments of mathematical exposition; the gradual revelation of the plan of attack, the masterly ordering of the propositions, the stern elimination of everything not immediately relevant to the purpose, the finish of the whole, are so impressive in their perfection as to create a feeling akin to awe in the mind of the reader.

Thomas Little Heath

Perhaps the least inadequate description of the general purpose of modern pure mathematics - I would not call it a definition - would be saying that it deals with form, in a very general sense of the term.

Ernest William Hobson

When we were students, and the result of an arithmetic problem was an integer, we were sure to have found the correct answer. The idea that simplicity implies the correctness is not, however, confined among schoolchildren.

Lewis Fry Richardson

	1	F	(1535) Giambattista della Porta
	2	S	(1815) George Boole RM094 (1826) Henry John Stephen Smith
	3	S	(1867) Martin Wilhelm Kutta (1878) Arthur Byron Coble (1896) Raymond Louis Wilder (1906) Carl Benjamin Boyer
45	4	M	(1744) Johann (III) Bernoulli RM093 (1865) Pierre Simon Girard
	5	T	(1848) James Whitbread Lee Glaisher (1930) John Frank Adams
	6	W	(1781) Giovanni Antonio Amedeo Plana RM154 (1906) Emma Markovna Trotskaia Lehmer
	7	T	(1660) Thomas Fantet de Lagny (1799) Karl Heinrich Graffe (1898) Raphael Salem
	8	F	(1656) Edmond Halley (1846) Eugenio Bertini (1848) Fredrich Ludwig Gottlob Frege (1854) Johannes Robert Rydberg
	9	S	(1847) Carlo Alberto Castigliano (1885) Hermann Klaus Hugo Weyl RM082 (1913) Hedwig Eva Maria Kiesler (Hedy Lamarr) RM144 (1922) Imre Lakatos
	10	S	(1829) Helwin Bruno Christoffel
46	11	M	(1904) John Henry Constantine Whitehead
	12	T	(1825) Michail Egorovich Vashchenko-Zakharchenko (1842) John William Strutt Lord Rayleigh (1927) Yutaka Taniyama
	13	W	(1876) Ernest Julius Wilkzynsky (1878) Max Wilhelm Dehn
	14	T	(1845) Ulisse Dini (1919) Paulette Libermann
	15	F	(1688) Louis Bertrand Castel (1793) Michel Chasles (1794) Franz Adolph Taurinus
	16	S	(1835) Eugenio Beltrami RM150
	17	S	(1597) Henry Gellibrand (1717) Jean Le Rond D'Alembert RM166 (1790) August Ferdinand Möbius RM118
47	18	M	(1872) Giovanni Enrico Eugenio Vacca (1927) Jon Leslie Britton
	19	T	(1894) Heinz Hopf (1900) Michail Alekseevich Lavrentev (1901) Nina Karlovna Bari
	20	W	(1889) Edwin Powell Hubble (1924) Benoît Mandelbrot (1963) William Timothy Gowers
	21	T	(1867) Dimitri Sintsov
	22	F	(1803) Giusto Bellavitis (1840) Émile Michel Hyacinthe Lemoine
	23	S	(1616) John Wallis RM070 (1820) Issac Todhunter (1917) Elizabeth Leonard Scott RM106
	24	S	(1549) Duncan Maclaren Young Sommerville (1909) Gerhard Gentzen
48	25	M	(1841) Fredrich Wilhelm Karl Ernst Schröder (1873) Claude Louis Mathieu (1943) Evelyn Merle Roden Nelson
	26	T	(1894) Norbert Wiener (1946) Enrico Bombieri
	27	W	(1867) Arthur Lee Dixon
	28	T	(1898) John Wishart
	29	F	(1803) Christian Andreas Doppler (1849) Horace Lamb (1879) Nikolay Mitrofanovich Krylov
	30	S	(1549) Sir Henry Savile (1969) Matilde Marcolli RM142

Rudi Mathematici

November

Putnam, 1998, B-5

Let N be the positive integer with 1998 decimal digits, all of them 1. Find the thousandth digit after the decimal point of $\sqrt{N}$.

Scientists and Light Bulbs

How many mathematicians does it take to screw in a light bulb?
One, who gives it to two relativist physicist, thereby reducing it to an earlier riddle.

Mathematical Nursery Rhymes (Graham)

Jack be nimble, Jack be quick,
Jack jump over the candlestick.
But figure out β and also time T
"a" due to gravity, velocity V,
And don't forget $y = VT \sin\beta$
Minus $\frac{1}{2}aT^2$, or you'll regret later.
Figure trajectory right to the inch
Or it may be a "singe" instead of a cinch!

Thus metaphysics and mathematics are, among all the sciences that belong to reason, those in which imagination has the greatest role. I beg pardon of those delicate spirits who are detractors of mathematics for saying this .... The imagination in a mathematician who creates makes no less difference than in a poet who invents.... Of all the great men of antiquity, Archimedes may be the one who most deserves to be placed beside Homer.

Jean Le Rond D'Alembert

That sometimes clear... and sometimes vague stuff... which is... mathematics.

Imre Lakatos

[His toast:] Pure mathematics, may it never be of any use to anyone.

Henry John Stephen Smith

Our federal income tax law defines the tax y to be paid in terms of the income x; it does so in a clumsy enough way by pasting several linear functions together, each valid in another interval or bracket of income. An archaeologist who, five thousand years from now, shall unearth some of our income tax returns together with relics of engineering works and mathematical books, will probably date them a couple of centuries earlier, certainly before Galileo and Viète.

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.

Norbert Wiener

	1	S	(1792) Nikolay Yvanovich Lobachevsky RM083 (1847) Christine Ladd-Franklin
49	2	M	(1831) Paul David Gustav du Bois-Reymond (1901) George Frederick James Temple
	3	T	(1903) Sidney Goldstein (1924) John Backus
	4	W	(1795) Thomas Carlyle
	5	T	(1868) Arnold Johannes Wilhelm Sommerfeld (1901) Werner Karl Heisenberg RM155 (1907) Giuseppe Occhialini RM122
	6	F	(1682) Giulio Carlo Fagnano dei Toschi
	7	S	(1647) Giovanni Ceva (1823) Leopold Kronecker (1830) Antonio Luigi Gaudenzio Giuseppe Cremona RM150 (1924) Mary Ellen Rudin
	8	S	(1508) Regnier Gemma Frisius (1865) Jaques Salomon Hadamard (1919) Julia Bowman Robinson
50	9	M	(1883) Nikolai Nikolaievich Luzin (1906) Grace Brewster Murray Hopper (1917) Sergei Vasilovich Fomin
	10	T	(1804) Karl Gustav Jacob Jacobi (1815) Augusta Ada King Countess Of Lovelace RM059
	11	W	(1882) Max Born RM155
	12	T	(1832) Peter Ludwig Mejdell Sylow
	13	F	(1724) Franz Ulrich Theodosius Aepinus (1887) George Polya RM131
	14	S	(1546) Tycho Brahe
	15	S	(1802) János Bolyai RM083 (1923) Freeman John Dyson
51	16	M	(1804) Wiktor Yakovievich Bunyakowsky
	17	T	(1706) Gabrielle Emile Le Tonnelier de Breteuil du Chatelet (1835) Felice Casorati (1842) Marius Sophus Lie (1900) Dame Mary Lucy Cartwright
	18	W	(1856) Joseph John Thomson RM161 (1917) Roger Lyndon (1942) Lenore Blum
	19	T	(1783) Charles Julien Brianchon (1854) Marcel Louis Brillouin (1887) Charles Galton Darwin RM138
	20	F	(1494) Oronce Fine (1648) Tommaso Ceva (1875) Francesco Paolo Cantelli
	21	S	(1878) Jan Łukasiewicz (1921) Edith Hirsch Luchins (1932) John Robert Ringrose
	22	S	(1824) Francesco Brioschi RM150 (1859) Otto Ludwig Hölder (1877) Tommaso Boggio (1887) Srinivasa Aiyangar Ramanujan
52	23	M	(1872) Georgii Yurii Pfeiffer
	24	T	(1822) Charles Hermite RM095 (1868) Emmanuel Lasker RM167
	25	W	(1642) Isaac Newton RM071 (1900) Antoni Zygmund
	26	T	(1780) Mary Fairfax Greig Somerville (1791) Charles Babbage RM059 (1937) John Horton Conway RM119
	27	F	(1571) Johannes Kepler (1654) Jacob (Jacques) Bernoulli RM093
	28	S	(1808) Athanase Louis Victoire Duprè (1882) Arthur Stanley Eddington (1903) John von Neumann RM107
	29	S	(1856) Thomas Jan Stieltjes
53	30	M	(1897) Stanislaw Saks
	31	T	(1872) Volodymyr Levitsky (1896) Carl Ludwig Siegel (1945) Leonard Adleman RM143 (1952) Vaughan Frederick Randall Jones

Rudi Mathematici

December

Putnam, 1998, B-6

Prove that, for any integers a, b, c, there exists a positive integer n such that $\sqrt{n^3+an^2+bn+c}$ is not an integer.

Scientists and Light Bulbs

How many light bulbs does it take to change a light bulb?
One, if it knows its own Gödel number.

Mathematical Nursery Rhymes (Graham)

Little Miss Muffet
Sat on a tuffet
Counting her surds, and say,
Along came a binar
And counted beside her,
Which frightened Miss Muffet away.

The sum of an infinite series whose final term vanishes perhaps is infinite, perhaps finite.

Jacob Bernoulli

The philosophers, moving in the middle of the concept of infinity without the experience and the precaution of mathematicians are like ships in the misty sea full of dangerous reefs, and yet blissfully unaware of the danger.

Max Born

A witty statesman said, you might prove anything by figures.

Thomas Carlyle

...You get surreal numbers by playing games. I used to feel guilty in Cambridge that I spent all day playing games, while I was supposed to be doing mathematics. Then, when I discovered surreal numbers, I realized that playing games IS mathematics.

John Horton Conway

I am acutely aware of the fact that the marriage between mathematics and physics, which was so enormously fruitful in past centuries, has recently ended in divorce.

Freeman John Dyson

The mathematics is not there till we put it there.

Arthur Stanley Eddington

[His epitaph:] Who, by vigor of mind almost divine, the motions and figures of the planets, the paths of comets, and the tides of the seas first demonstrated.

Isaac Newton