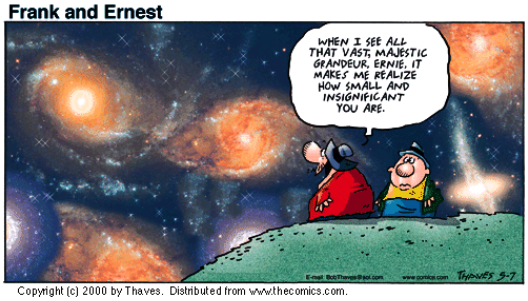
$$x^3 - 6'135x^2 + 12'545'291x - 8'550'637'845 = 0$$

Frank and Ernest



Frank and Ernest

Frank and Ernest

Frank and Ernest

	1	S	(1803) Guglielmo Libri Carucci dalla Sommaja (1878) Agner Krarup Erlang (1894) Satyendranath Bose (1912) Boris Gnedenko	RM132 RM168
1	2	M	(1822) Rudolf Julius Emmanuel Clausius (1905) Lev Genrichovich Shnirelman (1938) Anatoly Samoilenko	
	3	T	(1917) Yuri Alexeievich Mitropolsky	
	4	W	(1643) Isaac Newton	RM071
	5	T	(1723) Nicole-Reine Etable de Labrière Lepaute (1838) Marie Ennemond Camille Jordan (1871) Federigo Enriques (1871) Gino Fano	 RM084
	6	F	(1807) Jozeph Mitza Petzval (1841) Rudolf Sturm	
	7	S	(1871) Felix Edouard Justin Emile Borel (1907) Raymond Edward Alan Christopher Paley	
	8	S	(1888) Richard Courant (1924) Paul Moritz Cohn (1942) Stephen William Hawking	RM156
2	9	M	(1864) Vladimir Adreievich Steklov (1915) Mollie Orshansky	
	10	T	(1875) Issai Schur (1905) Ruth Moufang	
	11	W	(1545) Guidobaldo del Monte (1707) Vincenzo Riccati (1734) Achille Pierre Dionis du Sejour	RM120
	12	T	(1906) Kurt August Hirsch (1915) Herbert Ellis Robbins	 RM156
	13	F	(1864) Wilhelm Karl Werner Otto Fritz Franz Wien (1876) Luther Pfahler Eisenhart (1876) Erhard Schmidt (1902) Karl Menger	
	14	S	(1902) Alfred Tarski	RM096
	15	S	(1704) Johann Castillon (1717) Mattew Stewart (1850) Sofia Vasilievna Kovalevskaja	 RM144
3	16	M	(1801) Thomas Klausen	
	17	T	(1647) Catherina Elisabetha Koopman Hevelius (1847) Nikolay Egorovich Zukowsky (1858) Gabriel Koenigs	
	18	W	(1856) Luigi Bianchi (1880) Paul Ehrenfest	 RM204
	19	T	(1813) Rudolf Friedrich Alfred Clebsch (1879) Guido Fubini (1908) Aleksandr Gennadievich Kurosh	
	20	F	(1775) André Marie Ampère (1895) Gabor Szegő (1904) Renato Caccioppoli	 RM072
	21	S	(1846) Pieter Hendrik Schoute (1915) Yuri Vladimirovich Linnik	
	22	S	(1592) Pierre Gassendi (1886) John William Navin Sullivan (1908) Lev Davidovich Landau	 RM063
4	23	M	(1840) Ernst Abbe (1862) David Hilbert	 RM060
	24	T	(1891) Abram Samoilovitch Besicovitch (1914) Vladimir Petrovich Potapov	
	25	W	(1627) Robert Boyle (1736) Joseph-Louis Lagrange (1843) Karl Hermann Amandus Schwarz	 RM048
	26	T	(1799) Benoît Paul Émile Clapeyron (1862) Eliakim Hastings Moore	
	27	F	(1832) Charles Lutwidge Dodgson	RM108
	28	S	(1701) Charles Marie de La Condamine (1888) Louis Joel Mordell (1892) Carlo Emilio Bonferroni	
	29	S	(1817) William Ferrel (1888) Sidney Chapman	
5	30	M	(1619) Michelangelo Ricci	
	31	T	(1715) Giovanni Francesco Fagnano dei Toschi (1841) Samuel Loyd (1896) Sofia Alexandrovna Janowskaja (1945) Persi Warren Diaconis	 RM192 RM180

Rudi Mathematici

January

Putnam 2002, A1
Let k be a fixed positive integer. The n-th derivative of $1/(x^k-1)$ has the form $P_n(x)/(x^k-1)^{n+1}$ where $P_n(x)$ is a polynomial. Find $P_n(1)$.

A college football coach walked into the locker room before a big game, looked at his star quarterback, and said, "You're academically ineligible because you failed your math mid-term. But we really need you today. I talked to your math professor, and he said that if you can answer just one question correctly, then you can play today. So, pay attention. I really need you to concentrate on the question I'm about to ask you."
"Okay, coach," the player agreed. "I'll do my best."
"Good," said the coach. Then he asked, "Okay, now really focus. What is 2+2?" All of his teammates watched quietly while the quarterback thought about the question.
The quarterback thought for a moment. Sheepishly, he answered, "Um, 4?"
"Really?" said the coach. "Did you really just say 4?"
To which his teammates shouted, "Oh, c'mon, coach! Give him another chance!"

1. How many eggs can you put in an empty basket?
12. They pay out the award as follows: 1 dollar the first week, 1/2 dollar the second week, 1/3 dollar the third week, and so on.

And as for Mixed Mathematics, I may only make this prediction, that there cannot fail to be more kinds of them, as nature grows further disclosed.
Francis Bacon

"When I use a word, "Humpty Dumpty said, in a rather scornful tone, "it means just what I choose it to mean – neither more nor less."
"The question is," said Alice, "whether you can make words mean so many different things."
"The question is," said Humpty Dumpty, "which is to be master – that's all."
Charles Lutwidge Dodgson

An expert problem solver must be endowed with two incompatible qualities, a restless imagination and a patient pertinacity.
Howard W. Eves

Someone told me that each equation that I included in the book would halve the sales.
Stephen William Hawking

Mathematics knows no races or geographic boundaries; for mathematics, the cultural world is one country.
David Hilbert

Amusement is one of the fields of applied mathematics.
William F. White

	1	W	(1900) John Charles Burkill	
	2	T	(1522) Lodovico Ferrari	
			(1893) Cornelius Lanczos	
			(1897) Gertrude Blanch	
	3	F	(1893) Gaston Maurice Julia	RM073
	4	S	(1905) Eric Cristopher Zeeman	
	5	S	(1757) Jean Marie Constant Duhamel	
6	6	M	(1465) Scipione del Ferro	RM064
			(1612) Antoine Arnauld	
			(1695) Nicolaus (II) Bernoulli	RM093
	7	T	(1877) Godfried Harold Hardy	RM049
			(1883) Eric Temple Bell	
	8	W	(1700) Daniel Bernoulli	RM093
			(1875) Francis Ysidro Edgeworth	
			(1928) Ennio de Giorgi	RM133
	9	T	(1775) Farkas Wolfgang Bolyai	
			(1907) Harold Scott Macdonald Coxeter	RM097
	10	F	(1747) Aida Yasuaki	RM121
			(1932) Vivienne Malone-Mayes	
	11	S	(1657) Bernard Le Bovier de Fontenelle	
			(1800) William Henry Fox Talbot	RM205
			(1839) Josiah Willard Gibbs	
			(1915) Richard Wesley Hamming	
	12	S	(1914) Hanna Caemmerer Neumann	
			(1921) Kathleen Rita Mcnulty Mauchly Antonelli	
7	13	M	(1805) Johann Peter Gustav Lejeune Dirichlet	RM145
	14	T	(1468) Johann Werner	
			(1849) Hermann Hankel	
			(1877) Edmund Georg Hermann Landau	RM063
			(1896) Edward Artur Milne	
			(1932) Maurice Audin	RM194
	15	W	(1564) Galileo Galilei	RM085
			(1850) Sophie Willock Bryant	
			(1861) Alfred North Whitehead	
			(1946) Douglas Hofstadter	
	16	T	(1822) Francis Galton	
			(1853) Gregorio Ricci-Curbastro	
			(1903) Beniamino Segre	
	17	F	(1890) Sir Ronald Aylmer Fisher	
			(1891) Adolf Abraham Halevi Fraenkel	
			(1905) Rózsa Péter	
	18	S	(1404) Leon Battista Alberti	RM157
			(1919) Clifford Truesdell	
	19	S	(1473) Nicolaus Copernicus	RM181
8	20	M	(1844) Ludwig Boltzmann	RM061
	21	T	(1591) Girard Desargues	
			(1915) Evgeny Michailovich Lifshitz	
	22	W	(1857) Heinrich Rudolf Hertz	
			(1903) Frank Plumpton Ramsey	
	23	T	(1583) Jean-Baptiste Morin	
			(1905) Derrick Henry Lehmer	RM215
			(1922) Anneli Cahn Lax	
			(1951) Shigefumi Mori	
			(1561) Henry Briggs	RM169
	24	F	(1871) Felix Bernstein	
	25	S	(1827) Henry Watson	
	26	S	(1786) Dominique Francois Jean Arago	RM193
9	27	M	(1881) Luitzen Egbertus Jan Brouwer	
	28	T	(1735) Alexandre Theophile Vandermonde	
	29		(1860) Herman Hollerith	RM109

Rudi Mathematici

February

Putnam 2002, A2
Prove that among any n+3 points on an n-sphere, some n+2 of them lie on a closed hemisphere.

About a year ago, a small fire started in one of the hallways. An engineer, a scientist, and a statistician began debating the best way to extinguish the blaze.
"Dump some water on it!" the engineer suggested.
"No! Remove the oxygen!" said the scientist.
The statistician, however, started running around the building, starting fires in other locations. "What the heck are you doing?" the other two asked.
"Trying to create a decent sample size," he said.

2. How is the moon like a dollar?
1. Just one. Then it's no longer empty.

Each generation has its few great mathematicians, and mathematics would not even notice the absence of the others. They are useful as teachers, and their research harms no one, but it is of no importance at all. A mathematician is great or he is nothing.

Alfred W. Adler

Life is a school of probability.

Walter Bagehot

If "Number rules the universe" as Pythagoras asserted, Number is merely our delegate to the throne, for we rule Number.

Eric Temple Bell

Leibniz never married; he had considered it at the age of fifty; but the person he had in mind asked for time to reflect. This gave Leibniz time to reflect, too, and so he never married.

Bernard Le Bovier De Fontenelle

If men didn't know mathematics, they wouldn't rise a single palm from the ground.

Galileo Galilei

Pure mathematics is on the whole distinctly more useful than applied For what is useful above all is technique, and mathematical technique is taught mainly through pure mathematics.

Godfried Harold Hardy

Let us grant that the pursuit of mathematics is a divine madness of the human spirit, a refuge from the goading urgency of contingent happenings.

Alfred North Whitehead

	1	W	(1611) John Pell (1879) Robert Daniel Carmichael
	2	T	(1836) Julius Weingarten
	3	F	(1838) George William Hill (1845) Georg Cantor RM062 (1916) Paul Richard Halmos
	4	S	(1822) Jules Antoine Lissajous
	5	S	(1512) Gerardus Mercator (1759) Benjamin Gompertz (1817) Angelo Genocchi (1885) Pauline Sperry (1915) Laurent Schwartz RM194 (1931) Vera Pless
10	6	M	(1866) Ettore Bortolotti
	7	T	(1792) William Herschel RM146 (1824) Delfino Codazzi (1922) Olga Alexandrovna Ladyzhenskaya
	8	W	(1851) George Chrystal
	9	T	(1818) Ferdinand Joachimsthal (1900) Howard Hathaway Aiken
	10	F	(1864) William Fogg Osgood (1872) Mary Ann Elizabeth Stephansen
	11	S	(1811) Urbain Jean Joseph Le Verrier (1853) Salvatore Pincherle (1870) Louis Bachelier RM158
	12	S	(1685) George Berkeley (1824) Gustav Robert Kirchhoff (1859) Ernesto Cesaro
11	13	M	(1861) Jules Joseph Drach (1957) Rudy D'Alembert
	14	T	(1864) Jozef Kurschak (1879) Albert Einstein RM074 (1904) Lyudmila Vsevolodovna Keldysh
	15	W	(1860) Walter Frank Raphael Weldon (1868) Grace Chisolm Young
	16	T	(1750) Caroline Herschel RM146 (1789) Georg Simon Ohm (1846) Magnus Gosta Mittag-Leffler
	17	F	(1876) Ernest Benjamin Esclangon (1897) Charles Fox
	18	S	(1640) Philippe de La Hire (1690) Christian Goldbach RM122 (1796) Jacob Steiner (1870) Agnes Sime Baxter
	19	S	(1862) Adolf Kneser (1910) Jacob Wolfowitz
12	20	M	(1840) Franz Mertens (1884) Philip Franck (1938) Sergi Petrovich Novikov
	21	T	(1768) Jean Baptiste Joseph Fourier (1884) George David Birkhoff
	22	W	(1394) Ulugh Beg RM206 (1891) Lorna Mary Swain (1917) Irving Kaplansky (1944) Margaret Hilary Ashworth Millington
	23	T	(1754) Georg Freiherr von Vega (1882) Emmy Amalie Noether RM050 (1897) John Lighton Synge
	24	F	(1809) Joseph Liouville (1948) Sun-Yung (Alice) Chang (1966) Gigliola Staffilani RM142
	25	S	(1538) Christopher Clausius
	26	S	(1848) Konstantin Andreev (1913) Paul Erdős RM110
13	27	M	(1857) Karl Pearson
	28	T	(1749) Pierre-Simon de Laplace (1928) Alexander Grothendieck RM086
	29	W	(1825) Francesco Faà Di Bruno RM170 (1873) Tullio Levi-Civita RM098 (1896) Wilhelm Ackerman
	30	T	(1892) Stefan Banach RM134 (1921) Alfréd Rényi
	31	F	(1596) René Descartes

March

Putnam 2002, A3
Let $n \geq 2$ be an integer and T_n be the number of nonempty subsets S of {1, 2, 3, …, n} with the property that the average of the elements of S is an integer. Prove that $T_n - n$ is always even.

(…continues from February) The fires were extinguished one by one, but when they finished, there was an unused bucket of water. The statistician said to the mathematician, "Can you please get rid of that water?"
The mathematician proceeded to start another fire, and then he dumped the bucket of water on it.
"What'd you do that for?" the statistician asked.
"I reduced it to a previously solved problem," said the mathematician.

3. What coin doubles in value when half is taken away?
2. Both have four quarters.

The Hitch Hiker's Guide to the Galaxy offers this definition of the word "Infinite".
Infinite: Bigger than the biggest thing ever and then some. Much bigger than that in fact, really amazingly immense, a totally stunning size, "wow, that's big", time. Infinity is just so big that by comparison, bigness itself looks really titchy. Gigantic multiplied by colossal multiplied by staggeringly huge is the sort of concept we're trying to get across here.

Douglas Adams

I hope that posterity will judge me kindly, not only as to the things which I have explained, but also to those which I have intentionally omitted so as to leave to others the pleasure of discovery.

René Descartes

As far as the laws of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality.

Albert Einstein

...the source of all great mathematics is the special case, the concrete example. It is frequent in mathematics that every instance of a concept of seemingly great generality is in essence the same as a small and concrete special case.

Paul Richard Halmos

Bridges would not be safer if only people who knew the proper definition of a real number were allowed to design them.

N. David Mermin

If I feel unhappy, I do mathematics to become happy. If I am happy, I do mathematics to keep happy.

Alfréd Rényi

	1	S	(1640) Georg Mohr (1776) Marie-Sophie Germain (1895) Alexander Craig Aitken	
	2	S	(1878) Edward Kasner (1934) Paul Joseph Cohen	
14	3	M	(1835) John Howard Van Amringe (1892) Hans Rademacher (1900) Albert Edward Ingham (1909) Stanislaw Marcin Ulam (1971) Alice Riddle	RM171
	4	T	(1809) Benjamin Peirce (1842) Francois Edouard Anatole Lucas (1949) Shing-Tung Yau	RM123
	5	W	(1588) Thomas Hobbes (1607) Honoré Fabri (1622) Vincenzo Viviani (1869) Sergi Alexeievich Chaplygin	
	6	T	(1801) William Hallowes Miller	
	7	F	(1768) François-Joseph Français	
	8	S	(1903) Marshall Harvey Stone	
	9	S	(1791) George Peacock (1816) Charles Eugene Delaunay (1894) Cypra Cecilia Krieger Dunaij (1919) John Presper Heckert	
15	10	M	(1857) Henry Ernest Dudeney	RM183
	11	T	(1953) Andrew John Wiles	RM207
	12	W	(1794) Germinal Pierre Dandelin (1852) Carl Louis Ferdinand von Lindemann (1903) Jan Tinbergen	
	13	T	(1728) Paolo Frisi (1813) Duncan Farquharson Gregory (1869) Ada Isabel Maddison (1879) Francesco Severi	
	14	F	(1629) Christiaan Huygens	RM135
	15	S	(1452) Leonardo da Vinci (1548) Pietro Antonio Cataldi (1707) Leonhard Euler (1809) Herman Gunther Grassmann	RM051
	16	S	(1682) John Hadley (1823) Ferdinand Gotthold Max Eisenstein	
16	17	M	(1798) Etienne Bobillier (1853) Arthur Moritz Schonflies (1863) Augustus Edward Hough Love	
	18	T	(1791) Ottaviano Fabrizio Mossotti (1907) Lars Valerian Ahlfors (1918) Hsien Chung Wang (1949) Charles Louis Fefferman	RM150
	19	W	(1880) Evgeny Evgenievich Slutsky (1883) Richard von Mises (1901) Kiyoshi Oka (1905) Charles Ehresmann	
	20	T	(1839) Francesco Siacci	
	21	F	(1652) Michel Rolle (1774) Jean Baptiste Biot (1875) Teiji Takagi	
	22	S	(1811) Otto Ludwig Hesse (1887) Harald August Bohr (1935) Bhama Srinivasan (1939) Sir Michael Francis Atiyah	RM063
	23	S	(1858) Max Karl Ernst Ludwig Planck (1910) Sheila Scott Macintyre	
17	24	M	(1863) Giovanni Vailati (1899) Oscar Zariski	RM099
	25	T	(1849) Felix Christian Klein (1900) Wolfgang Pauli (1903) Andrei Nicolayevich Kolmogorov	RM159
	26	W	(1889) Ludwig Josef Johan Wittgenstein	
	27	T	(1755) Marc-Antoine Parseval des Chenes (1932) Gian-Carlo Rota	RM195
	28	F	(1906) Kurt Godel	RM087
	29	S	(1854) Jules Henri Poincarè	RM075
	30	S	(1777) Johann Carl Friedrich Gauss (1916) Claude Elwood Shannon	RM147 RM111

April

Putnam 2002, A4
In Determinant Tic-Tac-Toe, Player 1 enters a 1 in an empty 3×3 matrix. Player 0 counters with a 0 in a vacant position, and play continues in turn until the 3×3 matrix is completed with five 1's and four 0's. Player 0 wins if the determinant is 0 and player 1 wins otherwise. Assuming both players pursue optimal strategies, who will win and how?

In a race between two electric cars, one developed by a United States company, the other developed by a British firm, the American car prevailed. A French newspaper ran the following headline:
In Race Between Electric Cars, British Car Loses, and American Car Finishes Next-to-Last.

4. If you can buy 8 eggs for 26 cents, how many can you buy for a penny and a quarter?
3. A half dollar. Remove 'half,' and it becomes a dollar.

Let us now reflect on what mathematics is: in itself, it is an abstract system, an invention of the human spirit which as such in its purity does not exist. It is always approximated, but as such is an intellectual system, a great, ingenious invention of the human spirit. The surprising thing is that this invention of our human intellect is truly the key to understanding nature, that nature is truly structured in a mathematical way, and that our mathematics, invented by our human mind, is truly the instrument for working with nature, to put it at our service, to use it through technology. It seems to me almost incredible that an invention of the human mind and the structure of the universe coincide. Mathematics, which we invented, really gives us access to the nature of the universe and makes it possible for us to use it.

Pope Benedict XVI

The total number of Dirichlet's publications is not large; jewels are not weighed in a grocery scale.

Johann Carl Friedrich Gauss

Mechanics is the paradise of the mathematical sciences because by means of it one comes to the fruits of mathematics.

Leonardo Da Vinci

Science is built up with facts, as a house is with stones. But a collection of facts is no more a science than a heap of stones is a house.

Jules Henri Poincarè

You know we all became mathematicians for the same reason: we were lazy.

Max Rosenlicht

In the fall of 1972 President Nixon announced that the rate of increase of inflation was decreasing. This was the first time a sitting president used the third derivative to advance his case for re-election.

Hugo Rossi

18	1	M	(1825) Johann Jacob Balmer	RM122
			(1908) Morris Kline	
			(1977) Maryam Mirzakhani	RM189
	2	T	(1860) D'Arcy Wentworth Thompson	RM138
			(1905) Kazimierz Zarankiewitz	
	3	W	(1842) Otto Stolz	
			(1860) Vito Volterra	RM136
			(1892) George Paget Thomson	RM161
	4	T	(1845) William Kingdon Clifford	
	5	F	(1833) Lazarus Emmanuel Fuchs	
			(1883) Anna Johnson Pell Wheeler	
			(1889) René Eugène Gateaux	RM196
			(1897) Francesco Giacomo Tricomi	
			(1923) Cathleen Synge Morawetz	
	6	S	(1872) Willem de Sitter	
			(1906) André Weil	RM088
	7	S	(1854) Giuseppe Veronese	
			(1881) Ebenezer Cunningham	
			(1896) Pavel Sergieievich Alexandrov	
			(1926) Alexis Claude Clairaut	
19	8	M	(1859) Johan Ludwig William Valdemar Jensen	
			(1905) Winifred Lydia Caunden Sargent	
	9	T	(1746) Gaspard Monge	RM208
			(1876) Gilbert Ames Bliss	
			(1965) Karen Ellen Smith	
	10	W	(1788) Augustin Jean Fresnel	
			(1847) William Karl Joseph Killing	
			(1904) Edward James Mcshane	
			(1958) Piotr Rezierovich Silverbrahms	
	11	T	(1902) Edna Ernestine Kramer Lassar	
			(1918) Richard Phillips Feynman	RM076
	12	F	(1820) Florence Nightingale	RM104
			(1845) Pierre René Jean Baptiste Henry Brocard	
			(1902) Frank Yates	
	13	S	(1750) Lorenzo Mascheroni	
			(1899) Pelageia Yakovlevna Polubarinova Kochina	
	14	S	(1832) Rudolf Otto Sigismund Lipschitz	
			(1863) John Charles Fields	RM100
20	15	M	(1939) Brian Hartley	
			(1964) Sijue Wu	
	16	T	(1718) Maria Gaetana Agnesi	RM112
			(1821) Pafnuti Lvovi Chebyshev	
			(1911) John (Jack) Todd	RM139
	17	W	(1940) Alan Kay	
	18	T	(1850) Oliver Heaviside	RM160
			(1892) Bertrand Arthur William Russell	RM052
	19	F	(1865) Flora Philip	
			(1919) Georgii Dimitirievich Suvorov	
	20	S	(1861) Henry Seely White	
	21	S	(1471) Albrecht Dürer	RM124
			(1792) Gustave Gaspard de Coriolis	
21	22	M	(1865) Alfred Cardew Dixon	
	23	T	(1914) Lipa Bers	RM148
	24	W	(1544) William Gilbert	
	25	T	(1838) Karl Mikailovich Peterson	
	26	F	(1667) Abraham de Moivre	
			(1896) Yuri Dimitrievich Sokolov	
	27	S	(1862) John Edward Campbell	
	28	S	(1676) Jacopo Francesco Riccati	
			(1710) Johann (II) Bernoulli	RM093
22	29	M	(1882) Harry Bateman	
	30	T	(1814) Eugene Charles Catalan	RM184
	31	W	(1926) John Kemeny	

May

Putnam 2002, A5
Define a sequence by $a_0 = 1$, together with the rules $a_{2n+1} = a_n$ and $a_{2n+2} = a_n + a_{n+1}$ for each integer $n \geq 0$. Prove that every positive rational number appears in the set:

$$\{a_{n-1}/a_n : n \geq 1\}.$$

A physicist, an engineer, and a mathematician are using a public restroom.
The physicist finishes at the urinal, washes his hands very well using lots of soap and water, and says, "Physicists are very clean."
The engineer finishes, then washes his hands with a very small amount of soap and water. He says, "Engineers are able to make maximum use of scarce resources."
The mathematician finishes and walks out the door without washing his hands. On his way out, he says, "Mathematicians know enough to not piss on our hands."

5. What occurs once in a minute, twice in a week, but only once in a year?
4. Eight. A penny and a quarter is 26 cents.

I like your results. Let's make it a joint paper, and I'll write the next one.

Stefan Bergman

And since geometry is the right foundation of all painting, I have decided to teach its rudiments and principles to all youngsters eager for art.

Albrecht Dürer

The rules that describe nature seem to be mathematical. This is not the result of the fact that the observation is a judge, and it is not a necessary characteristic of science being mathematical. Simply it happens that mathematical laws can be formulated, at least in physics, which can make fantastic predictions. Why nature is mathematical is, once again, a mystery.

Richard Phillips Feynman

A good notation has a subtlety and suggestiveness which at times make it almost seem like a live teacher.

Bertrand Arthur William Russell

I learned in India a proverb that says: "Do not trust the calculations at least seven times, the mathematician not even a hundred times."

Malba Tahan

It is said that the history of mathematics should proceed in the same way as the musical analysis of a symphony. There are a number of themes. You can more or less see when a given theme occurs for the first time. Then it gets mixed up with the other themes, and the art of the composer consists in handling them all simultaneously. Sometimes the violin plays one theme, the flute plays another, then they exchange, and this goes on. The history of mathematics is just the same.

André Weil

	1	T	(1796) Sadi Leonard Nicolas Carnot	
			(1851) Edward Bailey Elliott	
			(1899) Edward Charles Titchmarsh	
	2	F	(1895) Tibor Radó	
	3	S	(1659) David Gregory	
	4	S	(1809) John Henry Pratt	
			(1966) Svetlana Yakovlevna Jitomirskaya	RM197
23	5	M	(1814) Pierre Laurent Wantzel	RM065
			(1819) John Couch Adams	
			(1883) John Maynard Keynes	
	6	T	(1436) Johann Muller Regiomontanus	RM185
			(1857) Aleksandr Michailovitch Lyapunov	RM077
			(1906) Max Zorn	
	7	W	(1863) Edward Burr Van Vleck	
	8	T	(1625) Giovanni Domenico Cassini	
			(1858) Charlotte Angas Scott	
			(1860) Alicia Boole Stott	
			(1896) Eleanor Pairman	RM209
			(1923) Gloria Olive	
			(1924) Samuel Karlin	
	9	F	(1885) John Edensor Littlewood	RM049
	10	S	(940) Mohammad Abu'L Wafa Al-Buzjani	
			(1887) Vladimir Ivanovich Smirnov	RM101
	11	S	(1881) Hilda Phoebe Hudson	
			(1937) David Bryant Mumford	
24	12	M	(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	W	(1736) Charles Augustin de Coulomb	
			(1856) Andrei Andreyevich Markov	RM125
			(1903) Alonzo Church	
	15	T	(1640) Bernard Lamy	
			(1894) Nikolai Gregorievich Chebotaryov	
	16	F	(1915) John Wilder Tukey	
	17	S	(1898) Maurits Cornelius Escher	RM097
	18	S	(1858) Andrew Russell Forsyth	
			(1884) Charles Ernest Weatherburn	
			(1884) Frieda Nugel	
			(1913) Paul Teichmueller	RM148
			(1915) Alice Turner Schafer	
25	19	M	(1623) Blaise Pascal	RM053
			(1902) Wallace John Eckert	
	20	T	(1873) Alfred Loewy	
			(1917) Helena Rasiowa	
	21	W	(1781) Simeon Denis Poisson	
			(1828) Giuseppe Bruno	
			(1870) Maria Skłodowska Curie	RM182
	22	T	(1822) Mario Pieri	
			(1864) Hermann Minkowsky	
			(1910) Konrad Zuse	
			(1932) Mary Wynne Warner	
	23	F	(1912) Alan Mathison Turing	RM089
	24	S	(1880) Oswald Veblen	
	25	S	(1908) William Van Orman Quine	
26	26	M	(1824) William Thomson, Lord Kelvin	RM161
			(1918) Yudell Leo Luke	
	27	T	(1806) Augustus de Morgan	
	28	W	(1875) Henri Leon Lebesgue	RM173
	29	T	(1888) Aleksandr Aleksandrovich Friedmann	RM101
			(1979) Artur Avila Cordeiro de Melo	RM189
	30	F	(1791) Felix Savart	
			(1958) Abigail A Thompson	

June

Putnam 2002, A6
Fix an integer $b \geq 2$. Let $f(1) = 1$, $f(2) = 2$, and for each $n \geq 3$, define $f(n) = nf(d)$, where d is the number of base-b digits of n. For which values of b does

$$\sum_{n=1}^{\infty} \frac{1}{f(x)}$$

converge?

Ten percent of all car thieves are left-handed.
All polar bears are left-handed.
If your car is stolen, there's a 10% chance it was taken by a polar bear.

Thirty-nine percent of unemployed men wear glasses.
Eighty percent of employed men wear spectacles.
Therefore, work causes bad vision.

Every second, 4,000 cans are opened around the world.
Every second, ten babies are conceived around the world.
Therefore, each time you open a can, you have a 1 in 400 chance of becoming pregnant.

6. What goes up but never comes down?
5. The letter 'e.'

63 out of 100 statistics are made up on the spot. Including this one.

Scott Adams

Mathematics is not yet capable of coping with the naiveté of the mathematician himself.

Abraham Kaplan

Now I feel as if I should succeed in doing something in mathematics, although I cannot see why it is so very important… The knowledge doesn't make life any sweeter or happier, does it?

Helen Keller

The difficulty lies, not in the new ideas, but in escaping the old ones, which ramify, for those brought up as most of us have been, into every corner of our minds.

John Maynard Keynes

Perfect clarity would profit the intellect but damage the will.

Blaise Pascal

Newton's binomium is as beautiful as the Venus de Milo. The problem is that precious few people notice.

Fernando Pessoa

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

Alan Mathison Turing

	1	S	(1643) Gottfried Wilhelm von Leibniz	RM054
			(1788) Jean Victor Poncelet	
			(1906) Jean Alexandre Eugène Dieudonné	
	2	S	(1820) William John Racquorn Rankine	
			(1852) William Burnside	
			(1925) Olga Arsen'evna Oleinik	
27	3	M	(1807) Ernest Jean Philippe Fauque de Jonquiere	RM162
			(1897) Jesse Douglas	
	4	T	(1906) Daniel Edwin Rutherford	
			(1917) Michail Samoilovich Livsic	
	5	W	(1936) James Mirrlees	
	6	T	(1849) Alfred Bray Kempe	
	7	F	(1816) Johann Rudolf Wolf	
			(1906) William Feller	
			(1922) Vladimir Aleksandrovich Marchenko	
	8	S	(1760) Christian Kramp	
			(1904) Henri Paul Cartan	RM126
	9	S	(1845) George Howard Darwin	RM138
			(1931) Valentina Mikhailovna Borok	RM197
28	10	M	(1856) Nikola Tesla	RM174
			(1862) Roger Cotes	
			(1868) Oliver Dimon Kellogg	
	11	T	(1857) Sir Joseph Larmor	
			(1888) Jacob David Tamarkin	RM101
			(1890) Giacomo Albanese	
	12	W	(1875) Ernest Sigismund Fischer	
			(1895) Richard Buckminster Fuller	RM066
			(1935) Nicolas Bourbaki	RM126
	13	T	(1527) John Dee	
			(1741) Karl Friedrich Hindenburg	
	14	F	(1671) Jacques D'Allonville	
			(1793) George Green	RM078
	15	S	(1865) Wilhelm Wirtinger	
			(1898) Mary Taylor Slow	
			(1906) Adolph Andrej Pavlovich Yushkevich	
	16	S	(1678) Jakob Hermann	
			(1903) Irmgard Flugge-Lotz	
29	17	M	(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	W	(1768) Francois Joseph Servois	
	20	T	(1876) Otto Blumenthal	
			(1947) Gerd Binnig	
	21	F	(1620) Jean Picard	
			(1848) Emil Weyr	
			(1849) Robert Simpson Woodward	
			(1861) Herbert Ellsworth Slaught	
	22	S	(1784) Friedrich Wilhelm Bessel	RM198
	23	S	(1775) Etienne Louis Malus	
			(1854) Ivan Slezynsky	
30	24	M	(1851) Friedrich Herman Schottky	
			(1871) Paul Epstein	
			(1923) Christine Mary Hamill	
	25	T	(1808) Johann Benedict Listing	
	26	W	(1903) Kurt Mahler	
	27	T	(1667) Johann Bernoulli	RM093
			(1801) George Biddel Airy	
			(1848) Lorand Baron von Eötvös	RM210
			(1867) Derrick Norman Lehmer	RM215
			(1871) Ernst Friedrich Ferdinand Zermelo	RM090
	28	F	(1954) Gerd Faltings	
	29	S	(1898) Isidor Isaac Rabi	
	30	S	(1889) Vladimir Kosma Zworkyn	
31	31	M	(1704) Gabriel Cramer	RM186
			(1712) Johann Samuel Koenig	
			(1926) Hilary Putnam	

July

Putnam 2002, B1
Alice shoots free throws on a basketball court. She hits the first and misses the second, and thereafter the probability that she hits the next shot is equal to the proportion of shots she has hit so far. What is the probability she hits exactly 50 of her first 100 shots?

A mathematician, an engineer, and a physicist are scheduled to appear at a science and engineering festival. The physicist observed that it behaved like a science and engineering festival, so it must be a science and engineering festival.
The mathematician compared it to a festival he had attended a year before, thereby reducing it to a previously solved problem.
The engineer was looking for a science and engineering festival; therefore, it was a science and engineering festival.

7. Why is it impossible for a human arm to be exactly 12 inches long?
6. Your age.

Statistics are the triumph of the quantitative method, and the quantitative method is the victory of sterility and death.

Hillaire Belloc

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

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

Hermann Hesse

I admit that mathematical science is a good thing. But excessive devotion to it is a worse thing.

Aldous Huxley

In mathematical analysis we call x the undetermined part of line a: the rest we don't call y, as we do in common life, but a-x. Hence mathematical language has great advantages over the common language.

Georg Christoph Lichtenberg

The outcome of any serious research can only be to make two questions grow where only one grew before.

Thorstein Veblen

	1	T	(1861) Ivar Otto Bendixson (1881) Otto Toeplitz (1955) Bernadette Perrin-Riou	
	2	W	(1856) Ferdinand Rudio (1902) Mina Spiegel Rees	
	3	T	(1914) Mark Kac	RM115
	4	F	(1805) Sir William Rowan Hamilton (1838) John Venn	RM079
	5	S	(1802) Niels Henrik Abel (1941) Alexander Keewatin Dewdney	RM055
	6	S	(1638) Nicolas Malebranche (1741) John Wilson	
31	7	M	(1868) Ladislaus Josephowitsch Bortkiewitz	
	8	T	(1902) Paul Adrien Maurice Dirac (1931) Sir Roger Penrose (1974) Manjul Bhargava	RM103 RM189
	9	W	(1537) Francesco Barozzi (Franciscus Barocius) (1940) Linda Goldway Keen	
	10	T	(1602) Gilles Personne de Roberval (1926) Carol Ruth Karp	
	11	F	(1730) Charles Bossut (1842) Enrico D'Ovidio	
	12	S	(1882) Jules Antoine Richard (1887) Erwin Rudolf Josef Alexander Schrödinger	 RM103
	13	S	(1625) Erasmus Bartholin (1819) George Gabriel Stokes (1861) Cesare Burali-Forti	 RM187
32	14	M	(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	 RM175
	16	W	(1773) Louis-Benjamin Francoeur (1821) Arthur Cayley	
	17	T	(1601) Pierre de Fermat	RM091
	18	F	(1685) Brook Taylor	
	19	S	(1646) John Flamsteed (1739) Georg Simon Klugel	
	20	S	(1710) Thomas Simpson (1863) Corrado Segre (1882) Wacław Sierpiński	
33	21	M	(1789) Augustin Louis Cauchy	RM127
	22	T	(1647) Denis Papin	
	23	W	(1683) Giovanni Poleni (1829) Moritz Benedikt Cantor (1842) Osborne Reynolds	
	24	T	(1561) Bartholomeo Pitiscus (1942) Karen Keskulla Uhlenbeck	 RM163
	25	F	(1561) Philip Van Lansberge (1844) Thomas Muir	 RM199
	26	S	(1728) Johann Heinrich Lambert (1875) Giuseppe Vitali (1965) Marcus Peter Francis du Sautoy	
	27	S	(1858) Giuseppe Peano	RM067
34	28	M	(1862) Roberto Marcolongo (1796) Irénée Jules Bienaymé	RM187
	29	T	(1904) Leonard Roth	
	30	W	(1703) Giovanni Ludovico Calandrini (1856) Carle David Tolmé Runge (1906) Olga Taussky-Todd	RM186 RM139
	31	T	(1821) Hermann Ludwig Ferdinand von Helmholtz (1885) Herbert Westren Turnbull	RM211

August

Putnam 2002, B2
Consider a convex polyhedron with at least five faces such that exactly three edges emerge from each of its vertices. Two players play the following game:
Each player, in turn, signs his or her name on a previously unsigned face. The winner is the player who first succeeds in signing three faces that share a common vertex.
Show that the player who signs first will always win by playing as well as possible.

What did 0 say to 8?
Nice belt!

A statistician's wife gives birth to twins. Excitedly, he calls everyone to share the good news. When he calls the minister, the minister says, "That's terrific! Bring them down to church this Sunday, and we'll baptize them!"
"Uh, let's just baptize one of them," says the statistician. "We can keep the other one as a control."

8. Only DEAD people can read hexadecimal. How many people can read hexadecimal?
7. Because then it would be a foot.

With the exception of the geometric series, there does not exist in all of mathematics a single infinite series whose sum has been determined rigorously.

Niels Henrik Abel

It is difficult to give an idea of the vast extent of modern mathematics.

Arthur Cayley

The algebraist complains of imperfection, when his language presents an anomaly, when he finds an exception which disturbs the simplicity of his notation, or the symmetrical structure of his syntax, when a formula has to be written with precaution, and a symbolism is not universal.

Sir William Rowan Hamilton

Logic doesn't apply to the real world.

Marvin Lee Minsky

To be sure, mathematics can be extended to any branch of knowledge, including economics, provided the concepts are so clearly defined as to permit accurate symbolic representation. That is only another way of saying that in some branches of discourse it is desirable to know what you are talking about.

James R. Newman

Angling may be said to be so like mathematics that it can never be fully learned.

Izaak Walton

	1	F	(1659) Joseph Saurin (1647) Giovanni Ceva (1835) William Stanley Jevons	RM203
	2	S	(1878) Mauriche René Frechet (1923) René Thom	RM080
	3	S	(1814) James Joseph Sylvester (1884) Solomon Lefschetz (1908) Lev Semenovich Pontryagin	RM104
35	4	M	(1809) Luigi Federico Menabrea	RM150
	5	T	(1667) Giovanni Girolamo Saccheri (1725) Jean Etienne Montucla	RM128
	6	W	(1859) Boris Jakovlevich Bukreev (1863) Dimitri Aleksandrovich Grave	
	7	T	(1707) George Louis Leclerc Comte de Buffon (1948) Cheryl Elisabeth Praeger (1955) Efim Zelmanov	
	8	F	(1584) Gregorius Saint-Vincent (1588) Marin Mersenne	RM092
	9	S	(1860) Frank Morley (1914) Marjorie Lee Browne	
	10	S	(1839) Charles Sanders Peirce	RM123
36	11	M	(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	RM212
	13	W	(1873) Constantin Carathéodory (1885) Wilhelm Johann Eugen Blaschke	
	14	T	(1858) Henry Burchard Fine (1891) Ivan Matveevich Vinogradov	
	15	F	(973) Abu Arrayhan Muhammad Ibn Ahmad Al'Biruni (1886) Paul Pierre Levy	RM164
	16	S	(1494) Francisco Maurolico (1736) Johann Nikolaus Tetens	
	17	S	(1743) Marie Jean Antoine Nicolas de Caritat de Condorcet (1826) Georg Friedrich Bernhard Riemann	RM176 RM068
37	18	M	(1752) Adrien Marie Legendre	RM140
	19	T	(1749) Jean Baptiste Delambre	
	20	W	(1842) Alexander Wilhelm von Brill (1861) Frank Nelson Cole	
	21	T	(1899) Juliusz Pawel Schauder (1917) Phyllis Nicolson	
	22	F	(1765) Paolo Ruffini (1769) Louis Puissant (1803) Jaques Charles Francois Sturm	RM116
	23	S	(1768) William Wallace (1900) David Van Dantzig	
	24	S	(1501) Girolamo Cardano (1625) Johan de Witt (1801) Michail Vasilevich Ostrogradski (1862) Winifred Edgerton Merrill (1945) Ian Nicholas Stewart	RM064 RM188 RM056
38	25	M	(1819) George Salmon (1888) Stefan Mazurkiewicz	
	26	T	(1688) Willem Jakob 's Gravesande (1854) Percy Alexander Macmahon (1891) Hans Reichenbach	
	27	W	(1855) Paul Émile Appell (1876) Earle Raymond Hedrick (1919) James Hardy Wilkinson	
	28	T	(1698) Pierre Louis Moreau de Maupertuis (1761) Ferdinand Francois Desirè Budan de Boislaurent (1873) Julian Lowell Coolidge	RM152
	29	F	(1540) François Viète (1561) Adriaan Van Roomen (1812) Adolph Gopel	RM200 RM200
	30	S	(1775) Robert Adrain (1829) Joseph Wolstenholme (1883) Ernst Hellinger	

Rudi Mathematici

September

Putnam 2002, B3
Show that, for all integers $n > 1$,

$$\frac{1}{2ne} < \frac{1}{e} - \left(1 - \frac{1}{n}\right)^n < \frac{1}{ne}$$

Two numbers were having a conversation about their social lives.
28: Did you hear that 284 broke up with 220?
6: I'm not surprised. He's far from perfect. But at least their break-up was amicable.
28: Yeah, well, I heard she started seeing 12.
6: Really? He doesn't have abundant charm. Don't you think 10 would be a better match for her?
28: I don't know. He seems so solitary!

9. How do you make 7 even?
8. 51,005 people, because DEAD = 51,005 in hexadecimal.

Scientific models are not true, and that makes them useful. They tell simple stories that our minds can grasp. They are lies for children, simplified stories to teach, and there is nothing wrong with it. The progress of science is to tell lies increasingly convincing to increasingly sophisticated children.

Jack Cohen, Terry Pratchett, Ian Stewart

For hundreds of pages the closely-reasoned arguments unroll, axioms and theorems interlock. And what remains with us in the end A general sense that the world can be expressed in closely-reasoned arguments, in interlocking axioms and theorems.

Michael Frayn

Sir, I have found you an argument, but I am not obliged to find you an understanding.

Samuel Johnson

Like the ski resort full of girls hunting for husbands and husbands hunting for girls, the situation is not as symmetrical as it might seem.

Alan Lindsay Mackay

In an examination those who do not wish to know ask questions of those who cannot tell.

Sir Walter Alexander Raleigh

Four circles to the kissing come,
The smaller are the benter.
The bend is just the inverse of
The distance from the centre.
Though their intrigue left Euclid dumb
There's now no need for rule of thumb.
Since zero bend's a dead straight line
And concave bends have minus sign,
The sum of squares of all four bends
Is half the square of their sum.

Frederick Soddy

	1	S	(1671) Luigi Guido Grandi (1898) Bela Kerekjarto' (1912) Kathleen Timpson Ollerenshaw	RM177
39	2	M	(1825) John James Walker (1908) Arthur Erdélyi	
	3	T	(1944) Pierre René Deligne	
	4	W	(1759) Louis Francois Antoine Arbogast (1797) Jerome Savary	
	5	T	(1732) Nevil Maskelyne (1781) Bernhard Placidus Johann Nepomuk Bolzano (1861) Thomas Little Heath	RM117
	6	F	(1552) Matteo Ricci (1831) Julius Wilhelm Richard Dedekind (1908) Sergei Lvovich Sobolev	RM141 RM081
	7	S	(1885) Niels Bohr	RM063
	8	S	(1908) Hans Arnold Heilbronn	
40	9	M	(1581) Claude Gaspard Bachet de Meziriac (1704) Johann Andrea von Segner (1873) Karl Schwarzschild (1949) Fan Rong K Chung Graham	RM201 RM153 RM110
	10	T	(1861) Heinrich Friedrich Karl Ludwig Burkhardt	
	11	W	(1675) Samuel Clarke (1777) Barnabè Brisson (1881) Lewis Fry Richardson (1885) Alfred Haar (1910) Cahit Arf	
	12	T	(1860) Elmer Sperry	
	13	F	(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	
	15	S	(1608) Evangelista Torricelli (1735) Jesse Ramsden (1776) Peter Barlow (1931) Eléna Wexler-Kreindler	RM165
41	16	M	(1879) Philip Edward Bertrand Jourdain	
	17	T	(1759) Jacob (II) Bernoulli (1888) Paul Isaac Bernays	RM093
	18	W	(1741) John Wilson (1945) Margaret Dusa Waddington Mcduff	
	19	T	(1903) Jean Frédéric Auguste Delsarte (1910) Subrahmanyan Chandrasekhar	 RM153
	20	F	(1632) Sir Christopher Wren (1863) William Henry Young (1865) Aleksandr Petrovich Kotelnikov	RM105
	21	S	(1677) Nicolaus (I) Bernoulli (1823) Enrico Betti (1855) Giovan Battista Guccia (1893) William Leonard Ferrar (1914) Martin Gardner	RM093 RM150 RM129 RM137
	22	S	(1587) Joachim Jungius (1895) Rolf Herman Nevanlinna (1907) Sarvadaman Chowla	
42	23	M	(1865) Piers Bohl	
	24	T	(1804) Wilhelm Eduard Weber (1873) Edmund Taylor Whittaker	
	25	W	(1811) Évariste Galois	RM069
	26	T	(1849) Ferdinand Georg Frobenius (1857) Charles Max Mason (1911) Shiing-Shen Chern	
	27	F	(1678) Pierre Remond de Montmort (1856) Ernest William Hobson	
	28	S	(1804) Pierre François Verhulst	
	29	S	(1925) Klaus Roth	
43	30	M	(1906) Andrej Nikolaevich Tichonov (1946) William Paul Thurston	
	31	T	(1711) Laura Maria Catarina Bassi (1815) Karl Theodor Wilhelm Weierstrass (1935) Ronald Lewis Graham	RM189 RM057 RM110

October

Putnam 2002, B4
An integer n, unknown to you, has been randomly chosen in the interval [1, 2002] with uniform probability. Your objective is to select n in an **odd** number of guesses. After each incorrect guess, you are informed whether n is higher or lower, and you **must** guess an integer on your next turn among the numbers that are still feasibly correct. Show that you have a strategy so that the chance of winning is greater than 2/3.

"Ladies and gentleman, we've lost an engine, but I want to assure you that there's nothing to worry about. We can still make it safely to Spokane with the other three engines. But instead of just 90 minutes, the flight will now take about 3 hours."
A few minutes later, the pilot spoke again. "Folks, it seems that we've lost a second engine. We're still okay, but the trip is now going to take us 6 hours." The statistician shifted uncomfortably in his seat.
A little while later still, the pilot delivered more bad news. "Ladies and gentleman, I'm really sorry to inform you that we've lost a third engine. But I can assure you that we're still safe. However, the trip will now take 12 hours."
Upon hearing this, the statistician became agitated. "Good Lord!" he shouted. "I sure hope we don't lose that fourth engine… or we'll be up here all day!"

10. One is the loneliest number, two's company, and three's a crowd. What is four and five?
9. Take away the 's.'

Any astronomer can predict with absolute accuracy just where every star in the heavens will be at 11:30 tonight. He can make no such prediction about his teenage daughter.

J. T. Adams

From the time of Kepler to that of Newton, and from Newton to Hartley, not only all things in external nature, but the subtlest mysteries of life and organization, and even of the intellect and moral being, were conjured within the magic circle of mathematical formulae.

Samuel Taylor Coleridge

Mathematicians have long since regarded it as demeaning to work on problems related to elementary geometry in two or three dimensions, in spite of the fact that it is precisely this sort of mathematics which is of practical value.

Branko Grünbaum

In real life, I assure you, there is no such thing as algebra.

Fran Lebowitz

But this is a degenerate case, where "degenerate", for a mathematician, means "terribly boring".

Neal Stephenson

November

	1	W	(1535) Giambattista della Porta	
	2	T	(1815) George Boole	RM094
			(1826) Henry John Stephen Smith	
	3	F	(1867) Martin Wilhelm Kutta	
			(1878) Arthur Byron Coble	
			(1896) Raymond Louis Wilder	
			(1906) Carl Benjamin Boyer	
	4	S	(1744) Johann (III) Bernoulli	RM093
			(1865) Pierre Simon Girard	
	5	S	(1848) James Whitbread Lee Glaisher	
			(1930) John Frank Adams	
44	6	M	(1906) Emma Markovna Trotskaia Lehmer	RM215
	7	T	(1660) Thomas Fantet de Lagny	
			(1799) Karl Heinrich Graffe	
			(1567) Clara Immerwahr	RM182
			(1898) Raphael Salem	
	8	W	(1656) Edmond Halley	RM190
			(1781) Giovanni Antonio Amedeo Plana	RM154
			(1846) Eugenio Bertini	
			(1848) Fredrich Ludwig Gottlob Frege	
			(1854) Johannes Robert Rydberg	
			(1869) Felix Hausdorff	RM178
	9	T	(1847) Carlo Alberto Castigliano	RM202
			(1885) Theodor Franz Eduard Kaluza	
			(1885) Hermann Klaus Hugo Weyl	RM082
			(1906) Jaroslav Borisovich Lopatynsky	
			(1913) Hedwig Eva Maria Kiesler (Hedy Lamarr)	RM144
			(1922) Imre Lakatos	
	10	F	(1829) Helwin Bruno Christoffel	
	11	S	(1904) John Henry Constantine Whitehead	
	12	S	(1825) Michail Egorovich Vashchenko-Zakharchenko	
			(1842) John William Strutt Lord Rayleigh	
			(1927) Yutaka Taniyama	
45	13	M	(1876) Ernest Julius Wilkzynsky	
			(1878) Max Wilhelm Dehn	
	14	T	(1845) Ulisse Dini	
			(1919) Paulette Libermann	
			(1975) Martin Hairer	RM189
	15	W	(1688) Louis Bertrand Castel	
			(1793) Michel Chasles	
			(1794) Franz Adolph Taurinus	
	16	T	(1835) Eugenio Beltrami	RM150
	17	F	(1597) Henry Gellibrand	
			(1717) Jean Le Rond D'Alembert	RM166
			(1790) August Ferdinand Möbius	RM118
	18	S	(1872) Giovanni Enrico Eugenio Vacca	
			(1927) Jon Leslie Britton	
	19	S	(1894) Heinz Hopf	
			(1900) Michail Alekseevich Lavrentev	
			(1901) Nina Karlovna Bari	RM214
46	20	M	(1889) Edwin Powell Hubble	
			(1924) Benoît Mandelbrot	
			(1963) William Timothy Gowers	
	21	T	(1867) Dimitri Sintsov	
	22	W	(1803) Giusto Bellavitis	
			(1840) Émile Michel Hyacinthe Lemoine	
	23	T	(1616) John Wallis	RM070
			(1820) Issac Todhunter	
			(1917) Elizabeth Leonard Scott	RM106
	24	F	(1549) Duncan Maclaren Young Sommerville	
			(1909) Gerhard Gentzen	
	25	S	(1841) Fredrich Wilhelm Karl Ernst Schröder	
			(1873) Claude Louis Mathieu	
			(1943) Evelyn Merle Roden Nelson	
	26	S	(1894) Norbert Wiener	RM172
			(1946) Enrico Bombieri	
47	27	M	(1867) Arthur Lee Dixon	
	28	T	(1898) John Wishart	
	29	W	(1803) Christian Andreas Doppler	
			(1849) Horace Lamb	
			(1879) Nikolay Mitrofanovich Krylov	
	30	T	(1549) Sir Henry Savile	
			(1969) Matilde Marcolli	RM142

Putnam 2002, B5
A palindrome in base b is a positive integer whose base-b digits read the same backwards and forwards; for example, 2002 is a 4-digit palindrome in base 10. Note that 200 is not a palindrome in base 10, but it is the 3-digit palindrome 242 in base 9, and 404 in base 7. Prove that there is an integer which is a 3-digit palindrome in base b for at least 2002 different values of b.

Teacher: What is 14 + 14?
Student: 28.
Teacher: That's good!
Student: Good? It's perfect!

Father: Did you learn a lot in math class today?
Son: Apparently not! They want me to come back again tomorrow!

A young boy asked his grandmother for help with his math homework. "I need to find the least common denominator," he told her. "My goodness," his grandmother replied. "I can't believe they still haven't found that. They were looking for that when I was in school!"

11. Why do statisticians hate to shop for clothes?
10. Nine.

Six is a number perfect in itself, and not because God created the world in six days; rather the contrary is true. God created the world in six days because this number is perfect, and it would remain perfect, even if the work of the six days did not exist.

Sant'Agostino

I'm very good at integral and differential calculus, I know the scientific names of beings animalculous; In short, in matters vegetable, animal, and mineral, I am the very model of a modern Major-General.

W.S. Gilbert

Without the concepts, methods and results found and developed by previous generations right down to Greek antiquity one cannot understand either the aims or achievements of mathematics in the last 50 years.

Hermann Klaus Hugo Weyl

The Advantage is that mathematics is a field in which one's blunders tend to show very clearly and can be corrected or erased with a stroke of the pencil. It is a field which has often been compared with chess, but differs from the latter in that it is only one's best moments that count and not one's worst. A single inattention may lose a chess game, whereas a single successful approach to a problem, among many which have been relegated to the wastebasket, will make a mathematician's reputation.

Norbert Wiener

	1	F	(1792) Nikolay Yvanovich Lobachevsky (1847) Christine Ladd-Franklin	RM083
	2	S	(1831) Paul David Gustav du Bois-Reymond (1869) Dimitri Fedorovich Egorov (1901) George Frederick James Temple	RM214
	3	S	(1903) Sidney Goldstein (1924) John Backus	
48	4	M	(1795) Thomas Carlyle	
	5	T	(1868) Arnold Johannes Wilhelm Sommerfeld (1901) Werner Karl Heisenberg (1907) Giuseppe Occhialini	RM155 RM122
	6	W	(1682) Giulio Carlo Fagnano dei Toschi	
	7	T	(1823) Leopold Kronecker (1830) Antonio Luigi Gaudenzio Giuseppe Cremona (1924) Mary Ellen Rudin	RM150
	8	F	(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	RM214
	10	S	(1804) Karl Gustav Jacob Jacobi (1815) Augusta Ada King Countess Of Lovelace	RM059
49	11	M	(1882) Max Born	RM155
	12	T	(1832) Peter Ludwig Mejdell Sylow (1913) Emma Castelnuovo	RM191
	13	W	(1724) Franz Ulrich Theodosius Aepinus (1887) George Polya	RM131
	14	T	(1546) Tycho Brahe	
	15	F	(1802) János Bolyai (1923) Freeman John Dyson	RM083
	16	S	(1804) Wiktor Yakovievich Bunyakowsky	
	17	S	(1706) Gabrielle Emile Le Tonnelier de Breteuil du Chatelet (1835) Felice Casorati (1842) Marius Sophus Lie (1900) Dame Mary Lucy Cartwright	
50	18	M	(1856) Joseph John Thomson (1917) Roger Lyndon (1942) Lenore Blum	RM161
	19	T	(1783) Charles Julien Brianchon (1854) Marcel Louis Brillouin (1887) Charles Galton Darwin	RM138
	20	W	(1494) Oronce Fine (1648) Tommaso Ceva (1875) Francesco Paolo Cantelli	RM203
	21	T	(1878) Jan Łukasiewicz (1921) Edith Hirsch Luchins (1932) John Robert Ringrose	
	22	F	(1824) Francesco Brioschi (1859) Otto Ludwig Hölder (1877) Tommaso Boggio (1887) Srinivasa Aiyangar Ramanujan	RM150
	23	S	(1872) Georgii Yurii Pfeiffer	
	24	S	(1822) Charles Hermite (1868) Emmanuel Lasker	RM095 RM167
51	25	M	(1642) Isaac Newton (1900) Antoni Zygmund	RM071
	26	T	(1780) Mary Fairfax Greig Somerville (1791) Charles Babbage (1937) John Horton Conway	RM059 RM119
	27	W	(1571) Johannes Kepler (1654) Jacob (Jacques) Bernoulli	RM093
	28	T	(1808) Athanase Louis Victoire Duprè (1882) Arthur Stanley Eddington (1903) John von Neumann	RM179 RM107
	29	F	(1856) Thomas Jan Stieltjes	
	30	S	(1897) Stanislaw Saks	
	31	S	(1872) Volodymyr Levitsky (1896) Carl Ludwig Siegel (1945) Leonard Adleman (1952) Vaughan Frederick Randall Jones	RM143

Rudi Mathematici

December

Putnam 2002, B6

Let p be a prime number. Prove that the determinant of the matrix

$$\begin{pmatrix} x & y & z \\ x^p & y^p & z^p \\ x^{p^2} & y^{p^2} & z^{p^2} \end{pmatrix}$$

is congruent modulo p to a product of polynomials of the form $ax + by + cz$, where a, b, c are integers. (We say two integer polynomials are congruent modulo p if corresponding coefficients are congruent modulo p.)

Heisenberg might have slept here.

Old mathematicians never die; they just lose some of their functions.

Whenever four mathematicians get together, you'll likely find a fifth.

"Take a positive integer n. No, wait, n is too large; take a positive integer k."

12. The math department organizes a raffle in which the prize is announced as an infinite amount of money paid over an infinite amount of time. With the promise of such a prize, the department is able to sell lots of tickets. How could the department offer such a prize and not go broke?
11. Lack of fit.

Standard mathematics has recently been rendered obsolete by the discovery that for years we have been writing the numeral five backward. This has led to re-evaluation of counting as a method of getting from one to ten. Students are taught advanced concepts of Boolean algebra, and formerly unsolvable equations are dealt with by threats of reprisals.

Woody Allen

I recognize the lion by his paw. [After reading an anonymous solution to a problem that he realized was Newton's solution.]

Jacob Bernoulli

Do not talk to me of Archimedes' lever. He was an absent-minded person with a mathematical imagination. Mathematics commands my respect, but I have no use for engines. Give me the right word and the right accent and I will move the world.

Joseph Conrad

Poetry is as precise as geometry.

Gustave Flaubert

In ancient times they had no statistics so they had to fall back on lies.

Stephen Leacock

To explain all nature is too difficult a task for any one man or even for any one age. 'Tis much better to do a little with certainty, and leave the rest for others that come after you, than to explain all things.

Isaac Newton