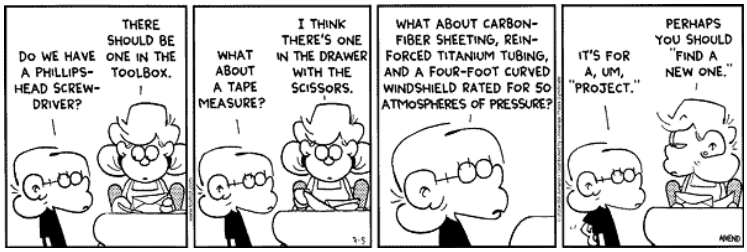
$$x^4-8192x^3+25163864x^2-34351710208x+17583965554320=0$$



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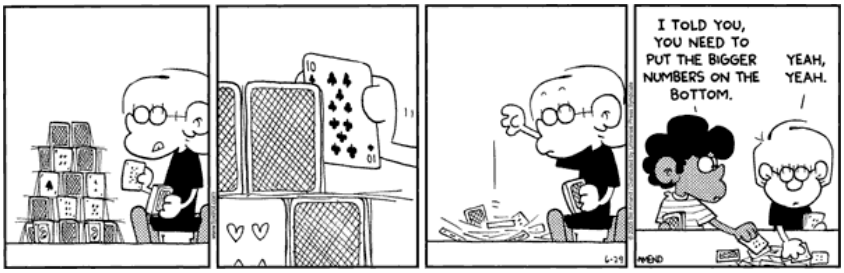
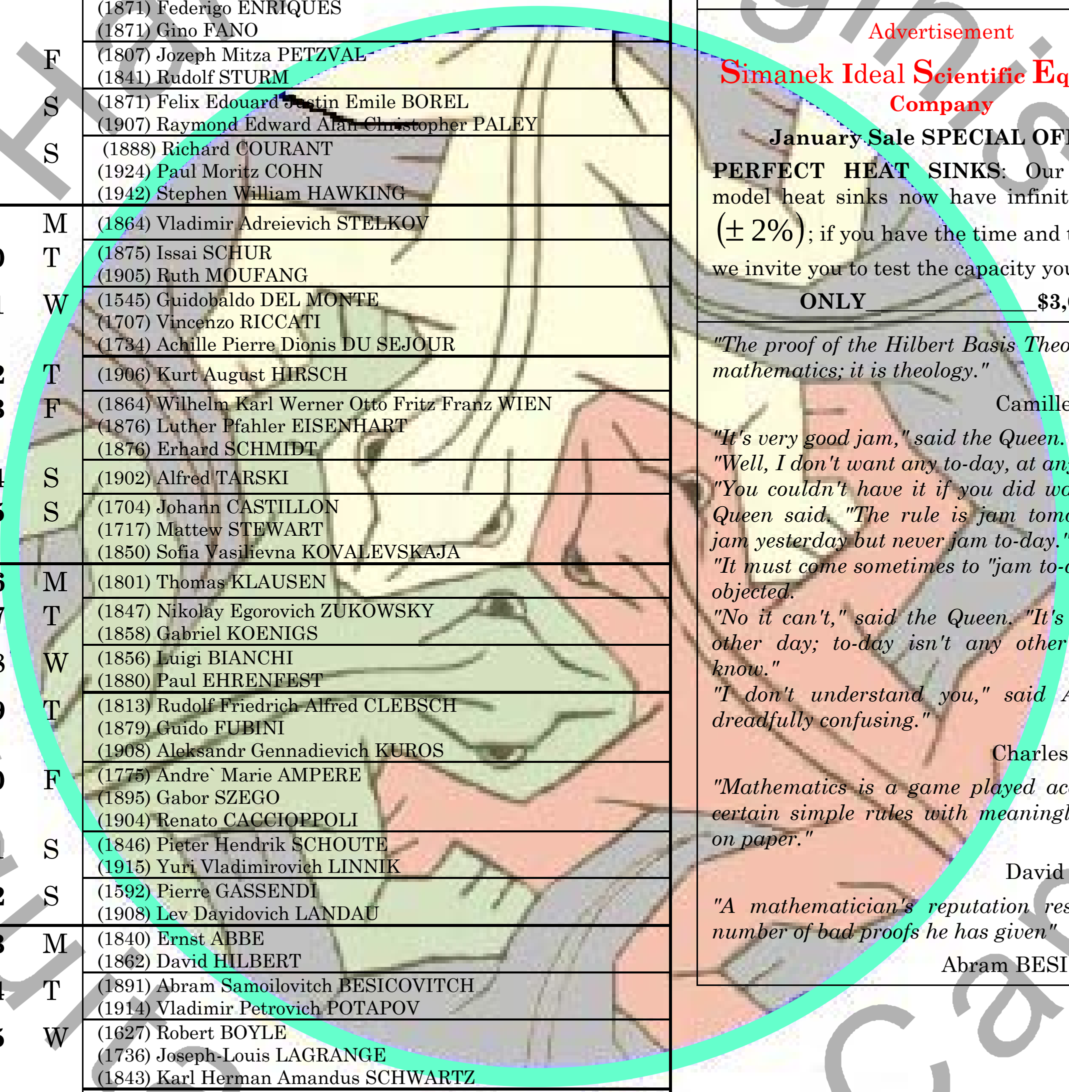


January



52	**1**	S	(1803) Guglielmo LIBRI Carucci dalla Sommaja (1878) Agner Krarup ERLANG (1894) Satyendranath BOSE (1912) Boris GNEDENKO
1	**2**	M	(1822) Rudolf Julius Emmanuel CLAUSIUS (1905) Lev Genrichovich SHNIRELMAN (1938) Anatoly SAMOILENKO
	3	T	(1917) Yuri Alexeievich MITROPOLSHY
	4	W	(1643) Isaac NEWTON
	5	T	(1838) Marie Ennemond Camille JORDAN (1871) Federigo ENRIQUES (1871) Gino FANO
	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
2	**9**	M	(1864) Vladimir Adreievich STELKOV
	10	T	(1875) Issai SCHUR (1905) Ruth MOUFANG
	11	W	(1545) Guidobaldo DEL MONTE (1707) Vincenzo RICCATI (1734) Achille Pierre Dionis DU SEJOUR
	12	T	(1906) Kurt August HIRSCH
	13	F	(1864) Wilhelm Karl Werner Otto Fritz Franz WIEN (1876) Luther Pfahler EISENHART (1876) Erhard SCHMIDT
	14	S	(1902) Alfred TARSKI
	15	S	(1704) Johann CASTILLON (1717) Mattew STEWART (1850) Sofia Vasilievna KOVALEVSKAJA
3	**16**	M	(1801) Thomas KLAUSEN
	17	T	(1847) Nikolay Egorovich ZUKOWSKY (1858) Gabriel KOENIGS
	18	W	(1856) Luigi BIANCHI (1880) Paul EHRENFEST
	19	T	(1813) Rudolf Friedrich Alfred CLEBSCH (1879) Guido FUBINI (1908) Aleksandr Gennadievich KUROS
	20	F	(1775) Andre` Marie AMPERE (1895) Gabor SZEGO (1904) Renato CACCIOPPOLI
	21	S	(1846) Pieter Hendrik SCHOUTE (1915) Yuri Vladimirovich LINNIK
	22	S	(1592) Pierre GASSENDI (1908) Lev Davidovich LANDAU
4	**23**	M	(1840) Ernst ABBE (1862) David HILBERT
	24	T	(1891) Abram Samoilovitch BESICOVITCH (1914) Vladimir Petrovich POTAPOV
	25	W	(1627) Robert BOYLE (1736) Joseph-Louis LAGRANGE (1843) Karl Herman Amandus SCHWARTZ
	26	T	(1799) Benoit Paul Emile CLAPEYRON
	27	F	(1832) Charles Lutwidge DODGSON
	28	S	(1701) Charles Marie de LA CONDAMINE (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

IMO 1959 - 1

Prove that

$$\frac{21n+4}{14n+3}$$

is irreducible for every natural number n.

Mathematics is made of 40 percent formulas, 40 percent proofs and 40 percent imagination.

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

Camille JORDAN

"It's very good jam," said the Queen.
"Well, I don't want any to-day, at any rate."
"You couldn't have it if you did want it," the Queen said. "The rule is jam tomorrow and jam yesterday but never jam to-day."
"It must come sometimes to "jam to-day,""Alice objected.
"No it can't," said the Queen. "It's jam every other day; to-day isn't any other day, you know."
"I don't understand you," said Alice. "It's dreadfully confusing."

Charles DODGSON

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

David HILBERT

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

Abram BESICOVITCH

February

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

IMO 1959 - 2

For what real values of x is

$$\sqrt{x+\sqrt{2x-1}}+\sqrt{x-\sqrt{2x-1}}=A,$$

given:

$A=\sqrt{2},$

$A=1,$

$A=2,$

where only non-negative real numbers are allowed in square roots and the root always denotes the non-negative root?

...the new prime number discovered recently is four times bigger then the previous record

CNN

"Common sense is not really so common"

Antoine ARNAUD

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

Godfried HARDY

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

Daniel BERNOULLI

"Epur si muove"

Galileo GALILEI

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

Dominique ARAGO

March

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

IMO 1959 - 3

Let a,b,c be real numbers. Given the equation for $\cos x$:

$$a\cos^2 x + b\cos x + c = 0,$$

form a quadratic equation in $\cos 2x$ whose roots are the same values of x. Compare the equations in $\cos x$ and $\cos 2x$ for:

$a = 4,$

$b = 2,$

$c = -1.$

Math is like love – a simple idea but it can get complicated.

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

George BERKELEY

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

Albert EINSTEIN

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

Irving KAPLANSKY

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

Paul ERDOS

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

Pierre Simon de LAPLACE

April

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

IMO 1959 - 4

Given the length $|AC|$, construct a triangle ABC with angle $A\hat{B}C = 90^\circ$, and the median BM satisfying:

$$BM^2 = AB \cdot BC .$$

In modern mathematics, algebra has become so important that numbers will soon only have symbolic meaning.

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

Paul Joseph COHEN

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

Stanislaw Marcin ULAM

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

Otto Ludwig HESSE

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

Max Karl Ernst Ludwig PLANCK

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

Felix KLEIN

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

Wolfgang PAULI

May

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

IMO 1959 - 5

An arbitary point M is taken in the interior of the segment AB. Squares $AMCD$ and $MBEF$ are constructed on the same side of AB. The circles circumscribed about these squares, with centers P and Q, intersect at M and N.

(a) Prove that AF and BC intersect at N;

(b) prove that the lines MN pass through a fixed point S (independent of M);

(c) find the locus of the midpoints of the segments PQ as M varies.

"The number you have dialed is imaginary. Please rotate your phone 90 degrees and try again."

"Nature is not embarrassed by difficulties of analysis."

Augustin Jean FRESNEL

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

Richard Phillips FEYNMAN

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

Pafnuti Lvovi CHEBYSHEV

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

Lipa BERS

June

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

IMO 1959 - 6

The planes P and Q are not parallel. The point A lies in P but not Q, and the point C lies in Q but not P. Construct points B in P and D in Q such that the quadrilateral $ABCD$ satisfies the following conditions:

(1) it lies in a plane,

(2) the vertices are in the order A, B, C, D,

(3) it is an isosceles trapezoid with AB is parallel to CD (meaning that $AD = BC$, but AD is not parallel to BC unless it is a square), and

(4) a circle can be inscribed in $ABCD$ touching the sides.

The Ultimate Scientific Dictionary

Activation Energy: The useful quantity of energy available in one cup of coffee.

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

Edward Charles TICHMARSH

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

Maurits Cornelius ESCHER

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

Blaise PASCAL

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

Alan Mathison TURING

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

Henri LEBESGUE

July

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

IMO 1960 - 1

Determine all 3 digit numbers N which are divisible by 11 and where $\frac{N}{11}$ is equal to the sum of the squares of the digits of N

The Wonderful World of Chemistry

If you're not part of the solution, you're part of the precipitate

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

Richard Buckminster FULLER

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

John DEE

"CEIIOSSOTTUU"

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

Robert HOOKE

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

Francois Joseph SERVOIS

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

Johann BERNOULLI

August

31	**1**	T	(1861) Ivar Otto BENDIXSON (1881) Otto TOEPLITZ
	2	W	(1856) Ferdinand RUDIO (1902) Mina Spiegel REES
	3	T	(1914) Mark KAC
	4	F	(1805) Sir William Rowan HAMILTON (1838) John VENN
	5	S	(1802) Niels Henrik ABEL
	6	S	(1638) Nicolas MALEBRANCHE (1741) John WILSON
32	**7**	M	(1868) Ladislaus Josephowitsch BORTKIEWITZ
	8	T	(1902) Paul Adrien Maurice DIRAC
	9	W	(1537) Francesco BAROZZI (Franciscus Barocius)
	10	T	(1602) Gilles Personne de ROBERVAL
	11	F	(1730) Charles BOSSUT (1842) Enrico D'OVIDIO
	12	S	(1882) Jules Antoine RICHARD (1887) Erwin Rudolf Josef Alexander SCHRODINGER
	13	S	(1625) Erasmus BARTHOLIN (1819) George Gabriel STOKES (1861) Cesare BURALI-FORTI
33	**14**	M	(1530) Giovanni Battista BENEDETTI (1842) Jean Gaston DARBOUX (1865) Guido CASTELNUOVO (1866) Charles Gustave Nicolas de la VALLEE` POUSSIN
	15	T	(1863) Alekseĭ Nikolaevich KRYLOV (1892) Louis Pierre Victor duc de BROGLIE (1901) Petr Sergeevich NOVIKOV
	16	W	(12773) Louis Beniamin FRANCOEUR (1821) Arthur CAYLEY
	17	T	(1601) Pierre de FERMAT
	18	F	(1685) Brook TAYLOR
	19	S	(1646) John FLAMSTEED (1739) Georg Simon KLUGEL
	20	S	(1710) Thomas SIMPSON (1863) Corrado SEGRE (1882) Waclav SIERPINSKI
34	**21**	M	(1789) Augustin Louis CAUCHY
	22	T	(1647) Denis PAPIN
	23	W	(1683) Giovanni POLENI (1829) Moritz Benedikt CANTOR
	24	T	(1561) Bartholomeo PITISCUS (1942) Karen Keskulla UHLENBECK
	25	F	(1561) Philip van LANSBERGE (1844) Thomas MUIR
	26	S	(1728) Johann Heinrich LAMBERT (1875) Giuseppe VITALI
	27	S	(1858) Giuseppe PEANO
35	**28**	M	(1796) Irenee Jules BIENAYME`
	29	T	(1904) Leonard ROTH
	30	W	(1856) Carle David Tolme` RUNGE (1906) Olga TAUSSKY-TODD
	31	T	(1821) Hermann Ludwig Ferdinand von HELMHOLTZ

IMO 1960 - 2

For what real values of x does the following inequality hold:

$$\frac{4x^2}{\left(1-\sqrt{1+2x}\right)^2} < 2x+9\,?$$

The Wonderful World of Chemistry

When you smell an odorless gas, it is probably carbon monoxide

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

Ferdinand RUDIO

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

Mark KAC

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

Paul Adrien Maurice DIRAC

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

Pierre de FERMAT

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

Pierre de FERMAT

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

Leonard ROTH

September

35	1	F	(1659) Joseph SAURIN (1835) William Stankey JEVONS
	2	S	(1878) Mauriche Rene` FRECHET (1923) Rene` THOM
	3	S	(1814) James Joseph SYLVESTER (1884) Solomon LEFSCHETZ (1908) Lev Semenovich PONTRYAGIN
36	4	M	(1809) Luigi Federico MENABREA
	5	T	(1667) Giovanni Girolamo SACCHERI (1725) Jean Etienne MONTUCLA
	6	W	(1859) Boris Jakovlevich BUKREEV (1863) Dimitri Aleksandrovich GRAVE
	7	T	(1707) George Louis Leclerc comte de BUFFON (1955) Efim ZELMANOV
	8	F	(1584) Gregorius SAINT-VINCENT (1588) Marin MERSENNE
	9	S	(1860) Frank MORLEY
	10	S	(1839) Charles Sanders PEIRCE
37	11	M	(1623) Stefano degli ANGELI (1877) sir James Hopwood JEANS
	12	T	(1891) Antoine Andre` Louis REYNAUD (1900) Haskell Brooks CURRY
	13	W	(1873) Constantin CARATHEODORY (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
	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
38	18	M	(1752) Adrien Marie LEGENDRE
	19	T	(1749) Jean Baptiste DELAMBRE
	20	W	(1842) Alexander Wilhelm von BRILL (1861) Frank Nelson COLE
	21	T	(1899) Juliusz Pawel SCHAUDER
	22	F	(1765) Paolo RUFFINI (1769) Louis PUISSANT (1803) Jaques Charles Francois STURM
	23	S	(1768) William WALLACE (1900) David van DANTZIG
	24	S	(1501) Girolamo CARDANO (1625) Johan DE WITT (1801) Michail Vasilevich OSTROGRADSKI
39	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 Emile APPEL (1876) Earle Raymond HEDRICK (1919) James Hardy WILKINSON
	28	T	(1698) Pierre Louis Moreau de MAUPERTUIS (1761) Ferdinand Francois Desire` Budan de BOISLAURENT (1873) Julian Lowell COOLIDGE
	29	F	(1561) Adriaan van ROOMEN (1812) Adolph GOPEL
	30	S	(1775) Robert ADRAIN (1829) Joseph WOLSTENHOLME (1883) Ernst HELLINGER

IMO 1960 - 3

In a given right triangle ABC, the hypoteneuse BC, length a, is divided into n equal parts with n an odd integer. The central part subtends an angle α at A. h is the perpendicular distance from A to BC. Prove that:

$$\tan\alpha = \frac{4nh}{an^2 - a}$$

Math is like love – a simple idea but it can get complicated.

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

Rene' THOM

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

Solomon LEFSCHETZ

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

Charles Sanders PEIRCE

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

sir James Hopwood JEANS

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

Hans REICHENBACH

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

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

Julian Lowell COOLIDGE

October

39	1	S	(1671) Luigi Guido GRANDI (1898) Bela KEREKJARTO`
40	2	M	(1825) John James WALKER (1908) Arthur ERDELYI
	3	T	(1944) Pierre Rene` 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
	6	F	(1552) Matteo RICCI (1831) Julius Wilhelm Richard DEDEKIND (1908) Sergei Lvovich SOBOLEV
	7	S	(1885) Niels BOHR
	8	S	(1908) Hans Arnold HEILBRONN
41	9	M	(1581) Claude Gaspard BACHET de Meziriac (1704) Johann Andrea von SEGNER (1873) Karl SCHWARTZSCHILD
	10	T	(1861) Heinrich Friedrich Karl Ludwig BURKHARDT
	11	W	(1675) Samuel CLARKE (1777) Barnabe` BRISSON (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
42	16	M	(1879) Philip Edward Bertrand JOURDAIN
	17	T	(1759) Jacob (II) BERNOULLI (1888) Paul Isaac BERNAYS
	18	W	(1741) John WILSON
	19	T	(1903) Jean Frederic Auguste DELSARTE (1910) Subrahmanyan CHANDRASEKHAR
	20	F	(1632) Sir Cristopher WREN (1863) William Henry YOUNG (1865) Aleksandr Petrovich KOTELNIKOV
	21	S	(1677) Nicolaus (I) BERNOULLI (1823) Enrico BETTI (1855) Giovan Battista GUCCIA (1893) William LEonard FERRAR
	22	S	(1587) Joachim JUNGIUS (1895) Rolf Herman NEVANLINNA (1907) Sarvadaman CHOWLA
43	23	M	(1865) Piers BOHL
	24	T	(1804) Wilhelm Eduard WEBER (1873) Edmund Taylor WITTAKER
	25	W	(1811) Evariste GALOIS
	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 Francois VERHULST
	29	S	(1925) Klaus ROTH
44	30	M	(1906) Andrej Nikolaevich TIKHONOV
	31	T	(1815) Karl Theodor Wilhelm WEIERSTRASS

IMO 1960 - 4

Construct a triangle ABC given the lengths of the altitudes from A and B and the length of the median from A.

If it wasn't for T. A. Edison, we'd all be watching TV to the light of a candle.

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

Niels BOHR

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

Peter BARLOW

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

Charles BABBAGE

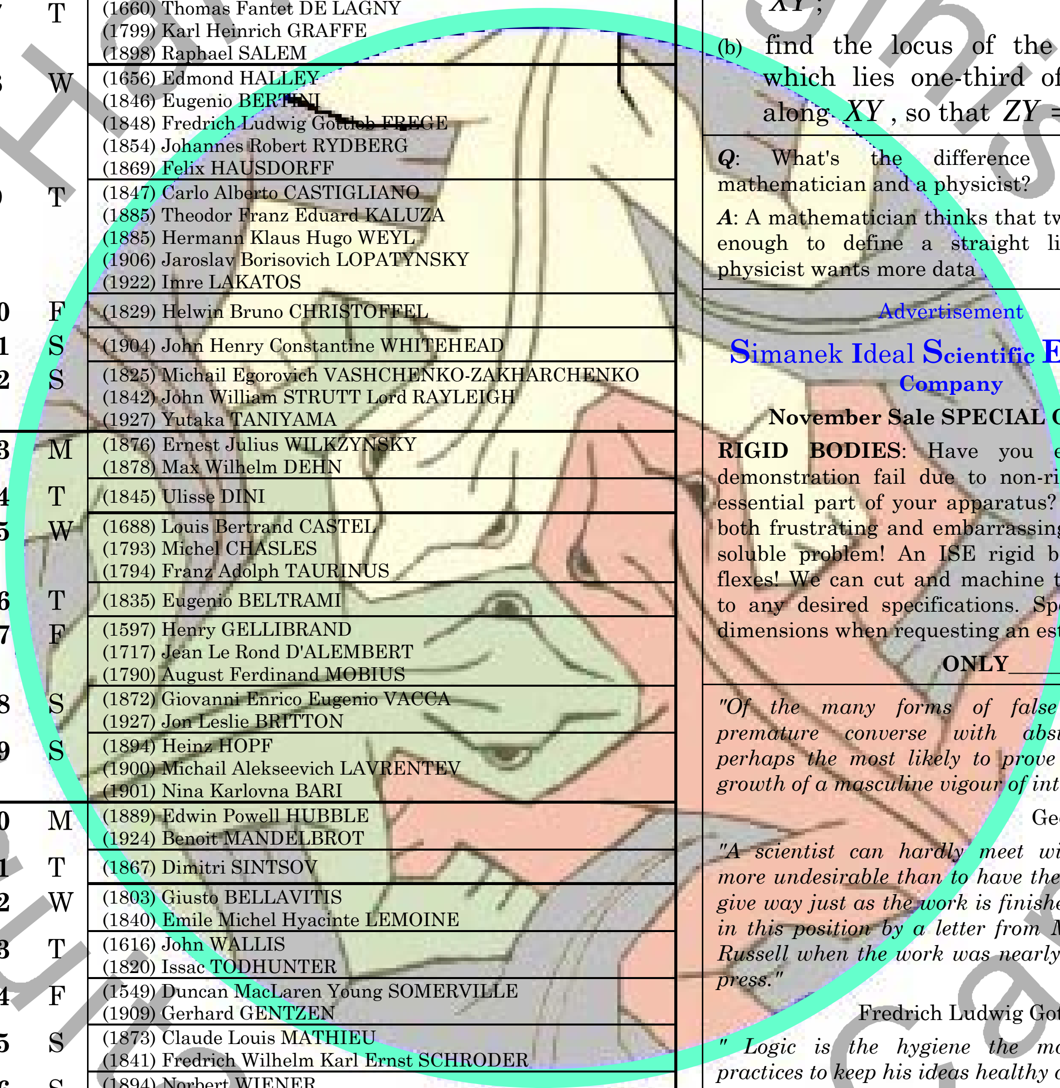
"Unfortunately what is little recognized is that the most worthwhile scientific books are those in which the author clearly indicates what he does not know; for an author most hurts his readers by concealing difficulties."

Evariste GALOIS

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

Karl Theodor Wilhelm WEIERSTRASS

November



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

IMO 1960 - 5

The cube $ABCDA'B'C'D'$ has A above A', B above B' and so on. X is any point of the face diagonal AC and Y is any point of $B'D'$.

(a) find the locus of the midpoint of XY;

(b) find the locus of the point Z which lies one-third of the way along XY, so that $ZY = 2XZ$.

Q: What's the difference between a mathematician and a physicist?

A: A mathematician thinks that two points are enough to define a straight line while a physicist wants more data.

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

George BOOLE

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

Fredrich Ludwig Gottlob FREGE

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

Hermann Klaus Hugo WEYL

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

John Henry Constantine WHITEHEAD

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

Benoit MANDELBROT

December

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

IMO 1960 - 6

A cone of revolution has an inscribed sphere tangent to the base of the cone (and to the sloping surface of the cone). A cylinder is circumscribed about the sphere so that its base lies in the base of the cone. The volume of the cone is V_1 and the volume of the cylinder is V_2.

(a) Prove that $V_1 \neq V_2$;

(b) Find the smallest possible value of $\frac{V_1}{V_2}$.

For this case construct the half angle of the cone

The speed of time is one second per second.

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

Jaques Salomon HADAMARD

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

Tycho BRACHE

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

Janos BOLYAI

" I believe there are 15 747 724 136 275 002 577 605 653 961 181 555 468 044 717 914 527 116 709 366 231 425 076 185 631 031 296 296 protons in the universe and the same number of electrons."

Arthur EDDINGTON

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

Augusta Ada KING Countess of LOVELACE

Mathematics consists of proving the most obvious thing in the least obvious way

George POLYA