The Hundred Greatest Theorems

The millenium seemed to spur a lot of people to compile "Top 100" or "Best 100" lists of many things, including movies (by the American Film Institute) and books (by the Modern Library). Mathematicians were not immune, and at a mathematics conference in July, 1999, Paul and Jack Abad presented their list of "The Hundred Greatest Theorems." Their ranking is based on the following criteria: "the place the theorem holds in the literature, the quality of the proof, and the unexpectedness of the result."

The list is of course as arbitrary as the movie and book list, but the theorems here are all certainly worthy results. I hope to over time include links to the proofs of them all; for now, you'll have to content yourself with the list itself and the biographies of the principals.

1	The Irrationality of the Square Root of 2	Pythagoras and his school	500 B.C.
2	Fundamental Theorem of Algebra	Karl Frederich Gauss	1799
3	The Denumerability of the Rational Numbers	Georg Cantor	1867
4	Pythagorean Theorem	Pythagoras and his school	500 B.C.
5	Prime Number Theorem	Jacques Hadamard and Charles-Jean de la Vallee Poussin (separately)	1896
6	Godel�s Incompleteness Theorem	Kurt Godel	1931
7	Law of Quadratic Reciprocity	Karl Frederich Gauss	1801
8	The Impossibility of Trisecting the Angle and Doubling the Cube	Pierre Wantzel	1837
9	The Area of a Circle	Archimedes	225 B.C.
10	Euler�s Generalization of Fermat�s Little Theorem (Fermat�s Little Theorem)	Leonhard Euler (Pierre de Fermat)	1760 (1640)
11	The Infinitude of Primes	Euclid	300 B.C.
12	The Independence of the Parallel Postulate	Karl Frederich Gauss, Janos Bolyai, Nikolai Lobachevsky, G.F. Bernhard Riemann collectively	1870-1880
13	Polyhedron Formula	Leonhard Euler	1751
14	Euler�s Summation of 1 + (1/2)^2 + (1/3)^2 + � (the Basel Problem).	Leonhard Euler	1734
15	Fundamental Theorem of Integral Calculus	Gottfried Wilhelm von Leibniz	1686
16	Insolvability of General Higher Degree Equations	Niels Henrik Abel	1824
17	DeMoivre�s Theorem	Abraham DeMoivre	1730
18	Liouville�s Theorem and the Construction of Trancendental Numbers	Joseph Liouville	1844
19	Four Squares Theorem	Joseph-Louis Lagrange	1770
20	Primes that Equal to the Sum of Two Squares (Genus theorem)	?	?
21	Green�s Theorem	George Green	1828
22	The Non-Denumerability of the Continuum	Georg Cantor	1874
23	Formula for Pythagorean Triples	Euclid	300 B.C.
24	The Undecidability of the Continuum Hypothesis	Paul Cohen	1963
25	Schroeder-Bernstein Theorem	?	?
26	Leibnitz�s Series for Pi	Gottfried Wilhelm von Leibniz	1674
27	Sum of the Angles of a Triangle	Euclid	300 B.C.
28	Pascal�s Hexagon Theorem	Blaise Pascal	1640

29	Feuerbach�s Theorem	Karl Wilhelm Feuerbach	1822
30	The Ballot Problem	J.L.F. Bertrand	1887
31	Ramsey�s Theorem	F.P. Ramsey	1930
32	The Four Color Problem	Kenneth Appel and Wolfgang Haken	1976
33	Fermat�s Last Theorem	Andrew Wiles	1993
34	Divergence of the Harmonic Series	Nicole Oresme	1350
35	Taylor�s Theorem	Brook Taylor	1715
36	Brouwer Fixed Point Theorem	L.E.J. Brouwer	1910
37	The Solution of a Cubic	Scipione Del Ferro	1500
38	Arithmetic Mean/Geometric Mean (Proof by Backward Induction) (Polya Proof)	Augustin-Louis Cauchy George Polya	? ?
39	Solutions to Pell�s Equation	Leonhard Euler	1759
40	Minkowski�s Fundamental Theorem	Hermann Minkowski	1896
41	Puiseux�s Theorem	Victor Puiseux (based on a discovery of Isaac Newton of 1671)	1850
42	Sum of the Reciprocals of the Triangular Numbers	Gottfried Wilhelm von Leibniz	1672
43	The Isoperimetric Theorem	Jacob Steiner	1838
44	The Binomial Theorem	Isaac Newton	1665
45	The Partition Theorem	Leonhard Euler	1740
46	The Solution of the General Quartic Equation	Lodovico Ferrari	1545
47	The Central Limit Theorem	?	?
48	Dirichlet�s Theorem	Peter Lejune Dirichlet	1837
49	The Cayley-Hamilton Thoerem	Arthur Cayley	1858
50	The Number of Platonic Solids	Theaetetus	400 B.C.
51	Wilson�s Theorem	Joseph-Louis Lagrange	1773
52	The Number of Subsets of a Set	?	?
53	Pi is Trancendental	Ferdinand Lindemann	1882
54	Konigsberg Bridges Problem	Leonhard Euler	1736
55	Product of Segments of Chords	Euclid	300 B.C.
56	The Hermite-Lindemann Transcendence Theorem	Ferdinand Lindemann	1882
57	Heron�s Formula	Heron of Alexandria	75
58	Formula for the Number of Combinations	?	?
59	The Laws of Large Numbers	<many>	<many>
60	Bezout�s Theorem	Etienne Bezout	?
61	Theorem of Ceva	Giovanni Ceva	1678
62	Fair Games Theorem	?	?
63	Cantor�s Theorem	Georg Cantor	1891
64	L�Hopital�s Rule	John Bernoulli	1696?
65	Isosceles Triangle Theorem	Euclid	300 B.C.
66	Sum of a Geometric Series	Archimedes	260 B.C.?

67	e is Transcendental	Charles Hermite	1873
68	Sum of an arithmetic series	Babylonians	1700 B.C.
69	Greatest Common Divisor Algorithm	Euclid	300 B.C.
70	The Perfect Number Theorem	Euclid	300 B.C.
71	Order of a Subgroup	Joseph-Louis Lagrange	1802
72	Sylow�s Theorem	Ludwig Sylow	1870
73	Ascending or Descending Sequences	Paul Erdos and G. Szekeres	1935
74	The Principle of Mathematical Induction	Levi ben Gerson	1321
75	The Mean Value Theorem	Augustine-Louis Cauchy	1823
76	Fourier Series	Joseph Fourier	1811
77	Sum of kth powers	Jakob Bernouilli	1713
78	The Cauchy-Schwarz Inequality	Augustine-Louis Cauchy	1814?
79	The Intermediate Value Theorem	Augustine-Louis Cauchy	1821
80	The Fundamental Theorem of Arithmetic	Euclid	300 B.C.
81	Divergence of the Prime Reciprocal Series	Leonhard Euler	1734?
82	Dissection of Cubes (J.E. Littlewood�s �elegant� proof)	R.L. Brooks	1940
83	The Friendship Theorem	Paul Erdos, Alfred Renyi, Vera Sos	1966
84	Morley�s Theorem	Frank Morley	1899
85	Divisibility by 3 Rule	?	?
86	Lebesgue Measure and Integration	Henri Lebesgue	1902
87	Desargues�s Theorem	Gerard Desargues	1650
88	Derangements Formula	?	?
89	The Factor and Remainder Theorems	?	?
90	Stirling�s Formula	James Stirling	1730
91	The Triangle Inequality	?	?
92	Pick�s Theorem	George Pick	1899
93	The Birthday Problem	?	?
94	The Law of Cosines	Francois Viete	1579
95	Ptolemy�s Theorem	Ptolemy	120?
96	Principle of Inclusion/Exclusion	?	?
97	Cramer�s Rule	Gabriel Cramer	1750
98	Bertrand�s Postulate	J.L.F. Bertrand	1860?
99	Buffon Needle Problem	Comte de Buffon	1733
100	Descartes Rule of Signs	Rene Descartes	1637