CHRONOLOGY OF
20th CENTURY MATHEMATICS

Date	Event
1900	**David Hilbert** (1862-1943) addresses the Second International Congress of Mathematicians in Paris.

Goursat begins publication *of Cours d'analyse mathematique (A Course in Mathematical Analysis).*

Sigmund Freud publishes *The Interpretation of Dreams*.

1901   **Henri Lebesgue** (1875-1941) formulates his theory of measure. His integral comes a year later.

Carle Runge (1856-1927) and **Martin Kutta** (1867-1944) develop their method for numerically solving differential equations.

Max Plank proposes quantum theory.

Discovery of principle blood types.

Guglielmo Marconi transmits wireless signal across the Atlantic Ocean.

Nobel Prizes first awarded.

1902   **Bertrand Russell** (1872-1970) describes his paradox in set theory in a letter to **Gottlob Frege** (1848-1925).

Beppo Levi states the axiom of choice.

Enrico Caruso makes first gramophone record.

1903   Wright brothers make first flight.

1904   **Henri Poincare** (1854-1912) proposes a theory of relativity and poses his conjecture.

Ernst Zermelo (1871-1953) uses the axiom of choice to prove the Well Ordering Principle.

1905   **Albert Einstein** (1879-1955) publishes his special theory of relativity.

1906   **Andrei Markov** (1856-1922) studies random processes.

1907   **Poul Heegard** (1871-1948) and **Max Dehn** (1871-1952) publish *Analysis Situs (The Analysis of Surfaces)*.

        L. E. J. Brouwer (1882-1966) writes his dissertation *On the Foundations of Mathematics*.

1908   **Ernst Zermelo** (1871-1953) publishes *Untersuchungen uber die Grundlagen der Mengenlehre (Investigations into the Foundations of Set Theory)*.

        Poincare publishes *Science et méthode (Science and Method)*.

        First Model T Ford is produced.

1909   **Edmund Landau** presents analytic number theory.

        Robert Peary reaches the North Pole.

1910   **Russell** and **Alfred Whitehead** (1861-1947) publish the first volume of *Principia Mathematica (Principles of Mathematics)*.

1911   Powers finds the 10th Mersenne prime.

1912   S.S. *Titanic* sinks.

1913   **G. H. Hardy** (1877-1947) and **Srinivasa Ramanujuan** (1887-1920) begin correspondence.

1914-1918 First World War.

1914   **Felix Hausdorff** (1868-1942) publishes *Grundzuge der Mengenlehre (Foundations of Set Theory)*.

Harald Bohr and **Landau** prove their theorem on the distribution of zeros of the zeta function.

Powers finds the 11th Mersenne prime.

The Panama Canal opens.

1915   **Einstein** publishes his general theory of relativity.

1916   **Waclaw Sierpinski** (1882-1969) finds first absolutely normal number.

1917   The Balfour Declaration promises Jews a home in Palestine.

1919   **Russell** publishes *Introduction to Mathematical Philosophy*.

Adolf Hitler founds National Socialist German Workers' Party.

1921   **Amalie Emmy Noether** (1882-1935) publishes *Idealtheorie in Ringbereichen (Theory of Ideal in Rings)*.

Emil Borel (1871-1956) studies game theory.

Keynes publishes his *Treatise on Probability*.

Sir Ronald Fisher introduces the concept of likelihood into statistics.

1922   **Nikolai Chebotaryov** (1894-1947) proves the density theorem on primes in an arithmetic progression.

Banach writes his thesis on measure theory.

Fraenkel attempts to put set theory into an axiomatic setting.

Lewis Richardson publishes *Weather Prediction by Numerical Processes*.

Tomb of Tutankhamun discovered in Egypt.

USSR established.

1925   **Fisher** publishes *Statistical Methods for Research Workers*.

     Adolf Hitler publishes *Mein Kampf*.

1926   **Reidemeister** publishes *Knoten und gruppen (Knots and groups)*.

1927   **Artin** publishes *Beweis des allgemeinen Reziprozitätsgesetzes*.

     First talking picture.

     Charles Lindbergh flies across the Atlantic Ocean.

1928   **John Von Neumann** (1903-1957) proves the Minimax Theorem in game theory.

     Walt Disney introduces Mickey Mouse.

     Alexander Fleming discovers penicillin.

1929   **Aleksandr Gelfand** (1906-1968) makes his conjecture.

     Wall Street crashes.

1930   **Kazimierz Kuratowski** (1896-1980) proves his theorem on planar graphs.

     Van der Waerden publishes *Modern Algebra*.

1931   **Kurt Godel** (1906-1978) publishes *Uber formal unentscheidbare Satze der Principia Mathematica und verwandter Systeme (On Formally Undecidable Propositions in Principia Mathematica and Related Systems)*.

     Von Mises introduces the idea of a sample space.

1932   **Alfred Haar** (1885-1933) introduces his measure.

     Von Neumann publishes *Grundlagen der Quantenmechanik (Foundations of Quantum Mechanics)*.

1933   **Andrey Kolmogorov** (1903-1987) publishes *Foundations on the Theory of Probability*.

Adolf Hitler becomes Chancellor of Germany.

1934   **Gelfand** and **Schneider** solve Hilbert's 7th problem independently.

Max Zorn (9106-1993) introduces his lemma.

Leray shows the existence of weak solutions to the Navier-Stokes equations.

1935   **Alonzo Church** (1903-1995) introduces lambda calculus.

1936   **Alan Turing** (1912-1954) publishes *On Computable Numbers*.

Church publishes his theorem.

Arab revolt in Palestine.

1937   **Vinogradov** publishes *Some theorems concerning the theory of prime numbers*.

Hindenburg zeppelin destroyed by fire.

1938   **Kolmogorov** lays foundation for Markov processes.

1939-1945   Second World War

1941   Japanese bomb Pearl Harbor.

Orson Wells makes *Citizen Kane*.

1942   Construction of the first nuclear reactor.

1944   **Emil Artin** (1898-1962) studies rings.

Von Neumann and **Morgenstern** publish *Theory of Games and Economic Behavior*.

Allied invasion of Normandy.

1945 United Nations established.

Atomic bombs dropped on Japan.

1946 Construction of first electronic digital computer.

1947 **George Dantzig** (1914-) introduces simplex method.

Dean Sea Scrolls found in Palestine.

1948 **Claude Shannon** (1916-2001) develops information theory.

Norbert Weiner (1894-1964) publishes *Cybernetics: or, Control and Communication in the Animal and the Machine*.

Creation of the State of Israel.

First Arab-Israeli War.

Assassination of Mahatma Gandhi.

1949 **John Mauchly** (1907-1980) and **John Eckert** (1919-1995) build the BINAC.

Atle Selberg (1917-) and **Paul Erdos** (1913-1996) prove the Prime Number Theorem.

Germany divides into East Germany and West Germany.

1950 **Richard Hamming** (1915-1998) studies coding.

1951 **Serre** introduces spectral sequences.

1952 Robinson goes on a Mersenne prime binge. He finds the next 5 Mersenne primes bringing the total to 17.

1953 Edmund Hillary climbs Mount Everest.

James Watson and Francis Crick describe the structure of DNA.

1954   **Kolmogorov** publishes on the theory of dynamical systems.

1955   **Yutaka Taniyama** (1927-1958) poses his conjecture.

Second Arab-Israeli War.

1956   **Milnor** publishes *On manifolds homeomorphic to the 7-sphere* which marks the birth of differential topology.

Rock and Roll music era begins.

1957   **Kolmogorov** solves Hilbert's 13th problem.

Riesel finds the 18th Mersenne prime.

Launch of first space satellite, *Sputnik 1*.

1959   Cuban revolution puts Fidel Castro in power in Cuba.

1961   Edward Lorenz discovers chaos.

Hurwitz find the next two Mersenne primes (19th and 20th).

Stephen Smale (1930-) makes progress on Poincare's Conjecture.

Berlin Wall is built.

Yuri Gagarin is first man in space.

1962-1965   Second Vatican Council.

1962   Cuban missile crisis.

1963   **Paul Cohen** (1934-) proves the independence of the axiom of choice and the continuum hypothesis.

John Thompson (1932-) and **Walter Feit** (1930-) publish *Solvability*

of Groups of Odd Order.

Gillies find the 21st, 22nd, and 23rd Mersenne primes.

Assassination of John F. Kennedy.

1964	Foundation of the Palestine Liberation Organization.
1965	**Reinhard Selton** (1930-) studies game theory.
1966	**L. J. Lander** and **T. R. Parkin** find a counterexample to Euler's Conjecture (using a computer).
	Alan Baker (1939-) proves Gelfand's Conjecture.
1967	Third Arab-Israeli War (the Six Day War).
1968	Assassination of Martin Luther King Jr.
1969	**Conway** discovers new sporadic finite simple groups.
	Neil Armstrong is first man on the moon.
1970	**Matiyasevich** shows that Hilbert's 10th problem is unsolvable.
1971	**Stephen Cook** formulates the P versus NP problem.
	Tuckerman finds the 24th Mersenne prime.
1972	**Rene Thom** (1923-2002) describes catastrophe theory.
	Pocket calculators invented.
1973	**Chen Jingrun** makes progress towards Goldbach's Conjecture.
	Fourth Arab-Israeli war.
1974	Richard M. Nixon resigns.
	First test tube babies are born.

1975   **Benoit Mandlebrot** (1924-) publishes *Les objets fractals, forn, hasard et dimension*.

           Mitchell Feigenbaum (1944-) discovers his constant.

           VCR first introduced.

1976   **Kenneth Appel** and **Wolfgang Haken** prove the Four Color Theorem (with a computer)

           Proofs and Refutations by **Lakatos** is published (two years after his death).

1977   **Adleman**, **Rivest**, and **Shamir** introduce public-key codes.

1978   Noll and Nickel find the 25th Mersenne prime.

           John Paul II becomes Pope.

1979   Saddam Hussein becomes president of Iraq.

           Noll finds the 26th Mersenne prime.

           Nelson and Slowinski find the 27th Mersenne prime.

1980-1988   Iran-Iraq War.

1980   The classification of finite simple groups is complete.

1981   First report of AIDS.

           First space shuttle flight.

1982   **Mandlebrot** publishes *The fractal geometry of nature*.

           Michael Freedman (1951-) makes progress towards Poincare's Conjecture.

           Slowinski finds 28th Mersenne prime.

The compact audio disc is invented.

1983   **Gerd Faltings** (1954-) proves Mordell's Conjecture.

Slowinski finds the 30th Mersenne prime.

IBM introduces the first personal computer.

1984   Assassination of Indira Gandhi.

1985   Slowinski finds the 31st Mersenne prime.

1986   Space Shuttle *Challenger* explodes.

1988   **Noam Elkies** finds a counterexample to Euler's Conjecture.

Robert Langlands (1936-) wins National Academy of Sciences Award.

Colquitt and Welsh find the 29th Mersenne prime.

1989   Berlin Wall comes down (reunification of Germany one year later).

1992   Slowinski and Gage find the 32nd Mersenne prime.

1994   **Andrew Wiles** (1953-) proves Fermat's Last Theorem.

Slowinski and Gage find the 33rd Mersenne prime.

1995   Texas banker Andrew Beal states his conjecture.

Jacques Chirac becomes president of France.

1996   Slowinski and Gage find the 34th Mersenne prime.

The Great Internet Mersenne Prime Search (GIMPS) finds the 35th Mersenne prime.

1997   The Great Internet Mersenne Prime Search (GIMPS) finds the 36th

Mersenne prime.

First successful cloning of a sheep.

1998	**Thomas Hales** solves Kepler's sphere packing problem.
	The Great Internet Mersenne Prime Search (GIMPS) finds the 37th Mersenne prime.
1999	The Great Internet Mersenne Prime Search (GIMPS) finds the 38th Mersenne Prime.
	Conrad and **Richard Taylor** prove the Taniyama-Shimura Conjecture.
2001	The Great Internet Mersenne Prime Search (GIMPS) finds the 39th Mersenne prime.
2002	**Martin Dunwoody** submitts a proof of the Poincare Conjecture.
2003	The Great Internet Mersenne Prime Search (GIMPS) announces the finding of perhaps the 40th Mersenne prime.