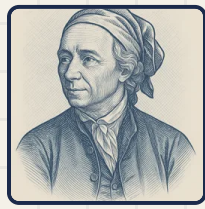
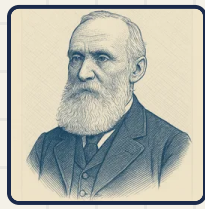


History of the Math

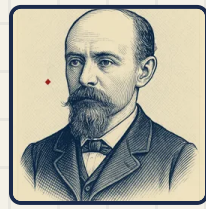
73 milestones from 250 BCE to 2019 — the derivations behind every engineer's daily calculations.



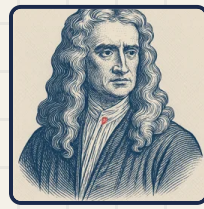
Leonhard Euler
1707–1783



William Thomson (Lord Kelvin)
1824–1907



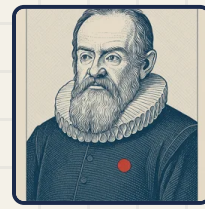
Oliver Heaviside
1850–1925



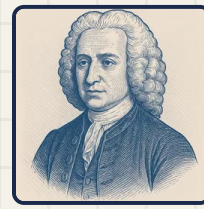
Isaac Newton
1643–1727



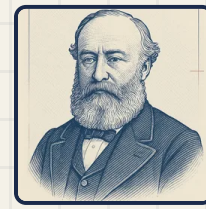
Harald Friis
1893–1976



Galileo Galilei
1564–1642



Daniel Bernoulli
1700–1782



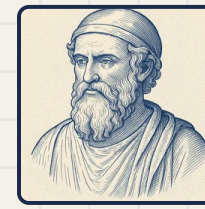
James Prescott Joule
1818–1889



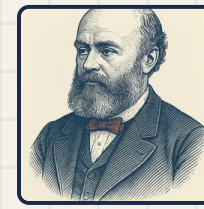
Heinrich Hertz
1857–1894



Ludwig Prandtl
1875–1953



Archimedes
-287–-212



William Rankine
1820–1872

● Aerospace ● Electrical / Rf ● Mechanical ● Test / Instrumentation ● Civil / Structural ● Chemical / Process ● Conversions

- 250 BCE ● **Archimedes (circa)** — Law of the lever proven from first principles.
- 1493 ● **Leonardo da Vinci (circa)** — Friction laws found experimentally — and left in notebooks.
- 1602 ● **Galileo Galilei (circa)** — Isochronism of small swings observed.
- 1614 ● **John Napier** — Publishes the first logarithm tables — the mathematical machinery under every dB.
- 1615 ● **Johannes Kepler** — Nova stereometria — wine-barrel gauging done with proto-calculus.
- 1643 ● **Evangelista Torricelli** — Mercury barometer — pressure measured as a column height.
- 1648 ● **Blaise Pascal & Florin Périer** — Puy de Dôme experiment proves pressure falls with altitude.
- 1656 ● **Christiaan Huygens** — Pendulum clock — timekeeping improves a hundredfold.
- 1662 ● **Robert Boyle** — P·V constant at fixed temperature.
- 1678 ● **Robert Hooke** — 'Ut tensio, sic vis' — the linear spring law published.
- 1687 ● **Isaac Newton** — Principia adds drag — and takes the parabola away.
- 1738 ● **Daniel Bernoulli** — Hydrodynamica — $\frac{1}{2}\rho V^2$ enters the pressure budget.
- 1744 ● **Leonhard Euler** — Critical buckling load derived via calculus of variations.
- 1745 ● **von Kleist & van Musschenbroek** — The Leyden jar — first capacitor, discovered twice.
- 1745 ● **Ewald von Kleist / Pieter van Musschenbroek** — The Leyden jar — capacitive energy storage.
- 1752 ● **Benjamin Franklin** — Charge conservation analysis of the jar.
- 1776 ● **Charles-Augustin de Coulomb** — Wedge theory of earth pressure — soil mechanics begins.
- 1782 ● **James Watt** — Horsepower defined — pumping becomes a priced commodity.
- 1796 ● **Pierre-Simon Laplace** — 'Dark stars' — escape velocity meets light speed (circa).
- 1799 ● **French Academy** — Platinum Mètre des Archives deposited.
- 1800 ● **Alessandro Volta** — The voltaic pile — the first battery.
- 1802 ● **Joseph Gay-Lussac** — Volume-temperature law published (crediting Charles).
- 1804 ● **Jean-Baptiste Biot** — Early experiments on conduction in bars (circa).
- 1811 ● **Amedeo Avogadro** — Equal volumes, equal molecules — n enters the equation.
- 1822 ● **Joseph Fourier** — Théorie analytique de la chaleur — heat flow proportional to ΔT .
- 1826 ● **Claude-Louis Navier** — Turns beam theory into usable engineering design formulas.
- 1827 ● **Georg Simon Ohm** — Publishes Die galvanische Kette — $V = IR$, to initial ridicule.
- 1831 ● **Michael Faraday** — Electromagnetic induction — the transformer's physics.
- 1834 ● **Émile Clapeyron** — Combined ideal gas equation $PV = nRT$.
- 1841 ● **James Prescott Joule** — Quantifies electrical heating — the $P = VI$ power relation.
- 1843 ● **Charles Wheatstone** — Bakerian Lecture popularizes the bridge (crediting Christie).
- 1845 ● **Gustav Kirchhoff** — Circuit laws, published at age 21, formalize series-parallel analysis.
- 1848 ● **William Thomson (Kelvin)** — Absolute thermodynamic temperature scale.
- 1853 ● **William Rankine** — The term 'potential energy' coined.
- 1859 ● **Gaston Planté** — Rechargeable lead-acid cell.
- 1865 ● **James Clerk Maxwell** — Field equations predict EM waves at the speed of light.
- 1867 ● **Joseph Monier** — Patents wire-reinforced concrete — planters first, structures soon after.
- 1873 ● **James Thomson** — Coins 'radian' at Queen's College Belfast.
- 1880 ● **Oliver Heaviside** — Coaxial cable patented.
- 1887 ● **Heinrich Hertz** — Generates and measures radio waves — $\lambda f = c$ confirmed on a lab bench.
- 1887 ● **Ernst Mach** — Schlieren photograph of a bullet's shock wave.
- 1893 ● **Charles Steinmetz** — Complex/phasor method tames AC calculation.
- 1896 ● **Niagara Falls plant** — AC power transmission wins; RMS becomes the lingua franca.
- 1896 ● **Henri Becquerel** — Radioactivity discovered in uranium salts.
- 1901 ● **Guglielmo Marconi** — Transatlantic radio makes path loss an engineering question.
- 1903 ● **Konstantin Tsiolkovsky** — The rocket equation published, with liquid fuel proposed.
- 1904 ● **Ludwig Prandtl** — Göttingen program makes supersonic flow an engineering science.
- 1919 ● **Robert Goddard** — 'A Method of Reaching Extreme Altitudes' — measured nozzle efficiency.
- 1920 ● **George Campbell / Bell System** — Image-parameter network design matures.
- 1926 ● **Robert Goddard** — First liquid-fuel rocket flight, Auburn, Massachusetts.
- 1927 ● **Harold Black** — Negative feedback, sketched on a ferry-ride newspaper.
- 1928 ● **Stepan Timoshenko** — 'Vibration Problems in Engineering' — the working handbook.
- 1944 ● **Harald Friis** — Noise-figure convention fixes $T_0 = 290$ K.
- 1947 ● **Chuck Yeager / Bell X-1** — First piloted supersonic flight — the relations flown.
- 1947 ● **Chuck Yeager** — First level supersonic flight — Mach 1 crossed.
- 1957 ● **Sergei Korolev / R-7** — The equation, staged, reaches orbit with Sputnik.
- 1957 ● **Sergei Korolev / Sputnik 1** — First artificial satellite proves the arithmetic.
- 1959 ● **International yard & pound agreement** — 1 ft = 0.3048 m exactly; the conversion becomes exact.
- 1959 ● **Soviet Luna 1** — First spacecraft to reach Earth escape velocity.
- 1959 ● **Six-nation agreement** — International yard: 1 in = 25.4 mm exactly.
- 1960 ● **CGPM** — The hertz adopted as the SI unit of frequency.
- 1960 ● **11th CGPM** — The watt enshrined in the new SI.
- 1962 ● **Nick Holonyak** — First practical visible LED (red, GaAsP).
- 1962 ● **Telstar / Bell System** — Satellite links make dB-column budgeting standard practice.
- 1962 ● **Nick Holonyak (GE)** — First practical visible (red) LED.
- 1964 ● **Lockheed Skunk Works** — SR-71 inlets stage oblique shocks to fly Mach 3.2 efficiently.
- 1964 ● **NASA / Hughes Syncom 3** — First geostationary satellite.
- 1971 ● **14th CGPM** — The pascal adopted as the SI unit of pressure.
- 1977 ● **NASA/JPL Deep Space Network** — Voyager budgets prove the method across the solar system.
- 1983 ● **17th CGPM** — Speed of light fixed by definition at 299,792,458 m/s.
- 1993 ● **Shuji Nakamura** — Blue GaN LED — white light, Nobel 2014.
- 1993 ● **Shuji Nakamura (Nichia)** — High-brightness blue GaN LED — white lighting unlocked.
- 2019 ● **26th CGPM** — Kelvin redefined via the Boltzmann constant.