

In the beginning

Friday, 2 August 2024 9:44 am

- **Introduce yourself**



- **Your Ambitions**






A man's worth is
no greater than
his ambitions.

Marcus Aurelius

BrainyQuote®



In life there is nothing more common
than talent and intelligence. What is
missing is passion, persistence,
commitment, and dedication.

CALVIN COOLIDGE

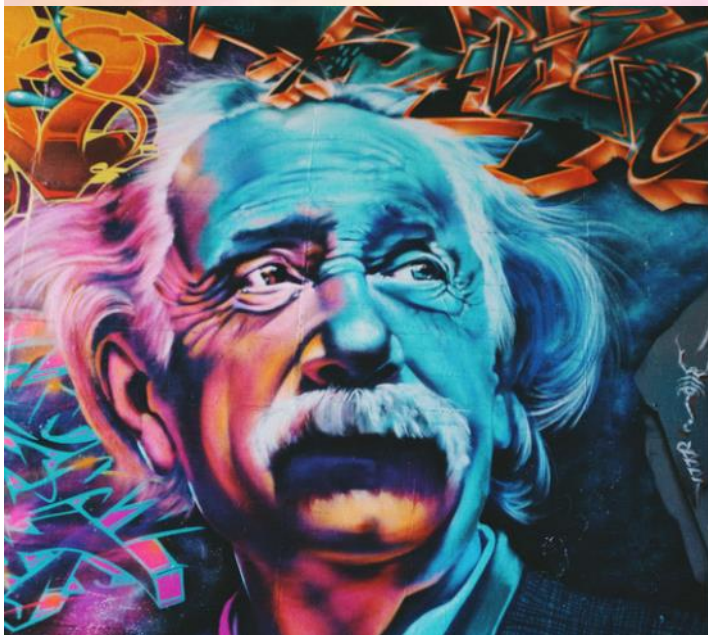
MINIMALISTQUOTES.COM

Curiosity vs Intelligence

$$CQ + PQ > IQ$$

*Curiosity Quotient + Passion Quotient >
Intelligence Quotient*

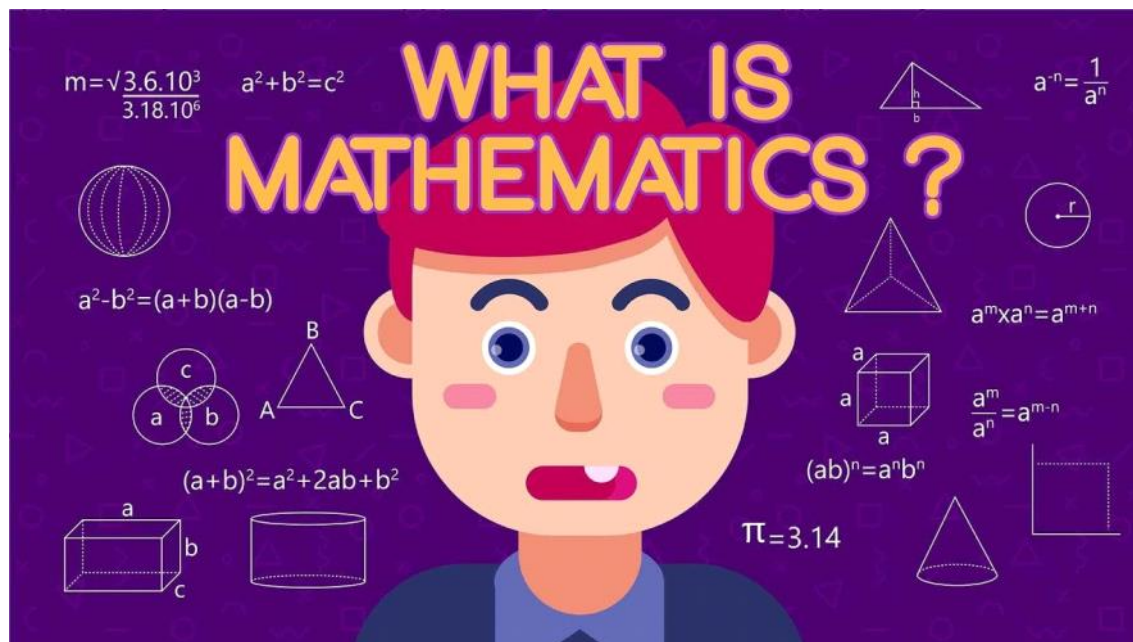
#learnedtoday



*"I have no special
talents, I am only
passionately
curious."*

ALBERT EINSTEIN

- Mathematics



The word *mathematics* comes from [Ancient Greek](#) *máthēma* ([μάθημα](#)), meaning "**that which is learnt**", "**what one gets to know**", hence also "study" and "science".

Its [adjective](#) is *mathēmatikós* (μαθηματικός), meaning "**related to learning**" or "**studious**", which likewise further came to mean "mathematical".

Similarly, one of the two main schools of thought in [Pythagoreanism](#) was known as the *mathēmatikoi* (μαθηματικοί)—which at the time meant "**learners**" rather than "mathematicians" in the modern sense.

What is Calculus?

Calculus, originally called infinitesimal calculus or "the calculus of [infinitesimals](#)", is the [mathematical](#) study of continuous change.

Infinitesimal calculus was developed independently in the late 17th century by [Isaac Newton](#) and [Gottfried Wilhelm Leibniz](#).



[Gottfried Wilhelm Leibniz](#) was the first to state clearly the rules of calculus.



[Isaac Newton](#) developed the use of calculus in his [laws of motion](#) and [universal gravitation](#).

History: Ancient precursors

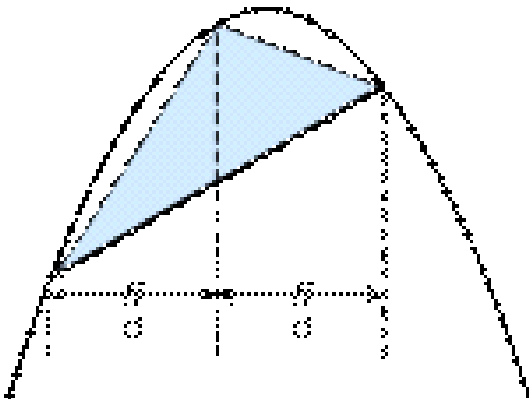
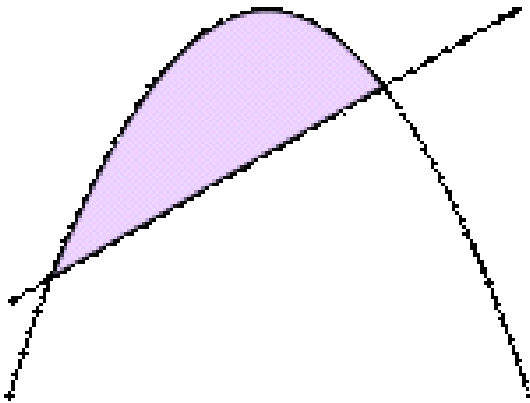
Egypt

Calculations of [volume](#) and [area](#), one goal of integral calculus, can be found in the [Egyptian Moscow papyrus](#) (c.1820 BC), but the formulae are simple instructions, with no indication as to how they were obtained.



Greece

See also: [Greek mathematics](#)



Archimedes used the [method of exhaustion](#) to calculate the area under a parabola in his work [Quadrature of the Parabola](#).

Laying the foundations for integral calculus and foreshadowing the concept of the limit, ancient Greek mathematician [Eudoxus of Cnidus](#) (c.390 – 337 BC) developed the [method of exhaustion](#) to prove the formulas for cone and pyramid volumes.



China

The **method of exhaustion** was later discovered independently in [China](#) by [Liu Hui](#) in the 3rd century AD in order to find the area of a circle.^{[10][11]} In the 5th century AD, [Zu Gengzhi](#), son of [Zu Chongzhi](#), established a method^{[12][13]} that would later be called [Cavalieri's principle](#) to find the volume of a [sphere](#).



Middle East

Ibn al-Haytham, 11th-century Arab mathematician and physicist

In the Middle East, [Hasan Ibn al-Haytham](#),

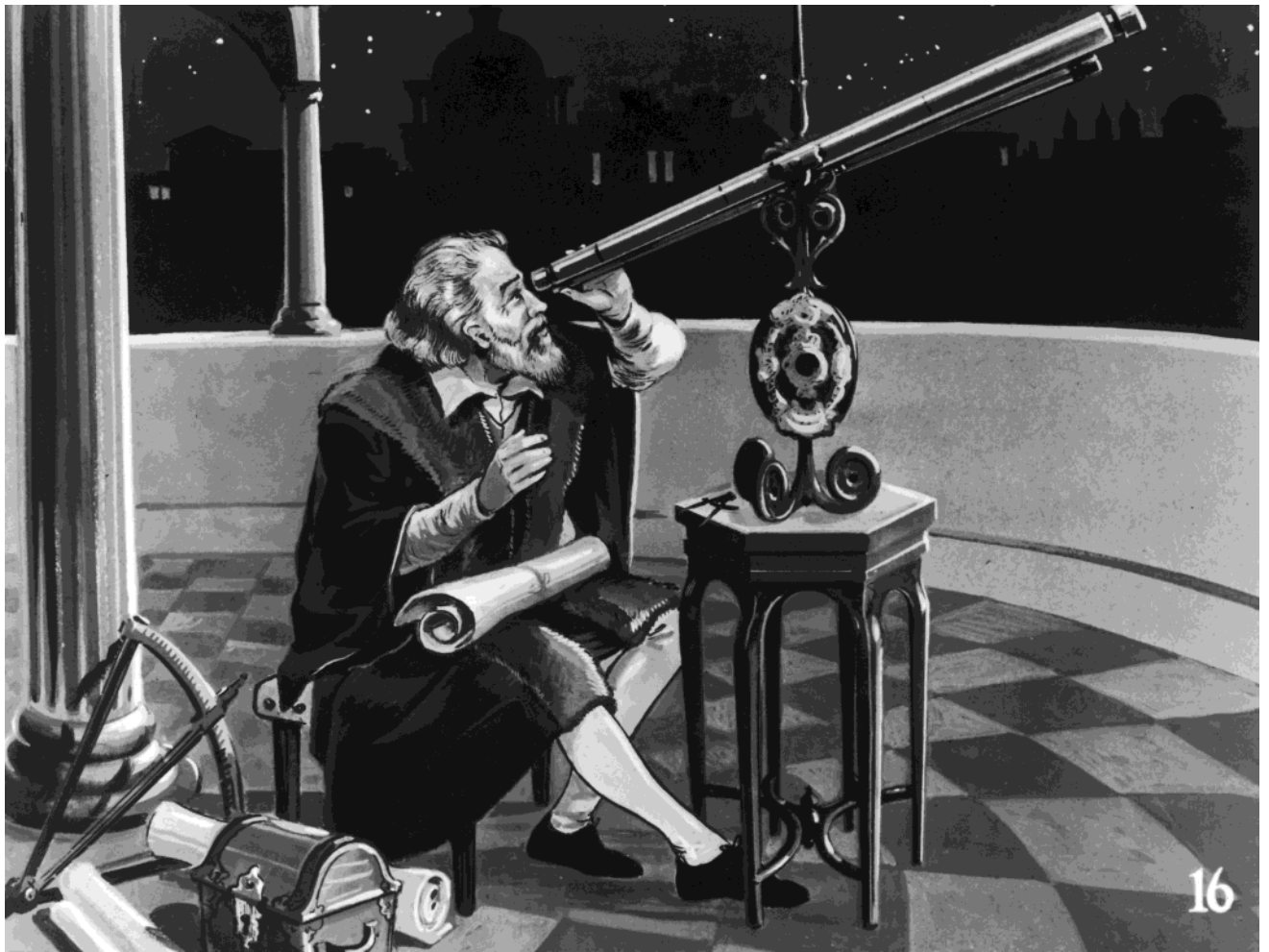


India

In the 14th century, Indian mathematicians gave a non-rigorous method, resembling differentiation, applicable to some trigonometric functions. [Madhava of Sangamagrama](#) .



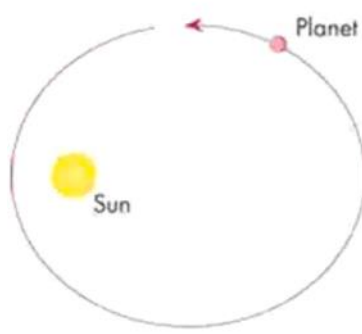
Modern Science



Galileo Galilei

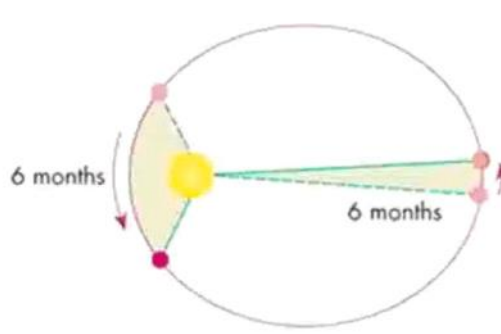
[Johannes Kepler](#)'s work *Stereometrica Doliorum* formed the basis of integral calculus.^{[17](#)} Kepler developed a method to calculate the area of an ellipse by adding up the lengths of many radii drawn from a focus of the ellipse.

Kepler's 3 Laws of Planetary Motion



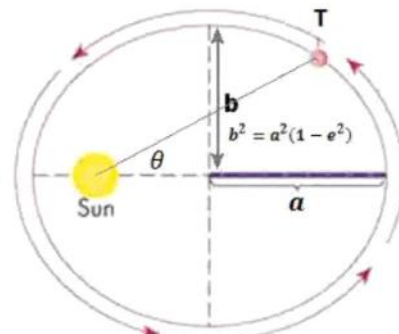
(1)

The orbits are ellipses



(2)

Equal areas in equal time



(3)

$T^2 \propto a^3$ T = time to complete orbit
 a = semi-major axis

Gottfried Wilhelm Leibniz & Sir Isaac Newton

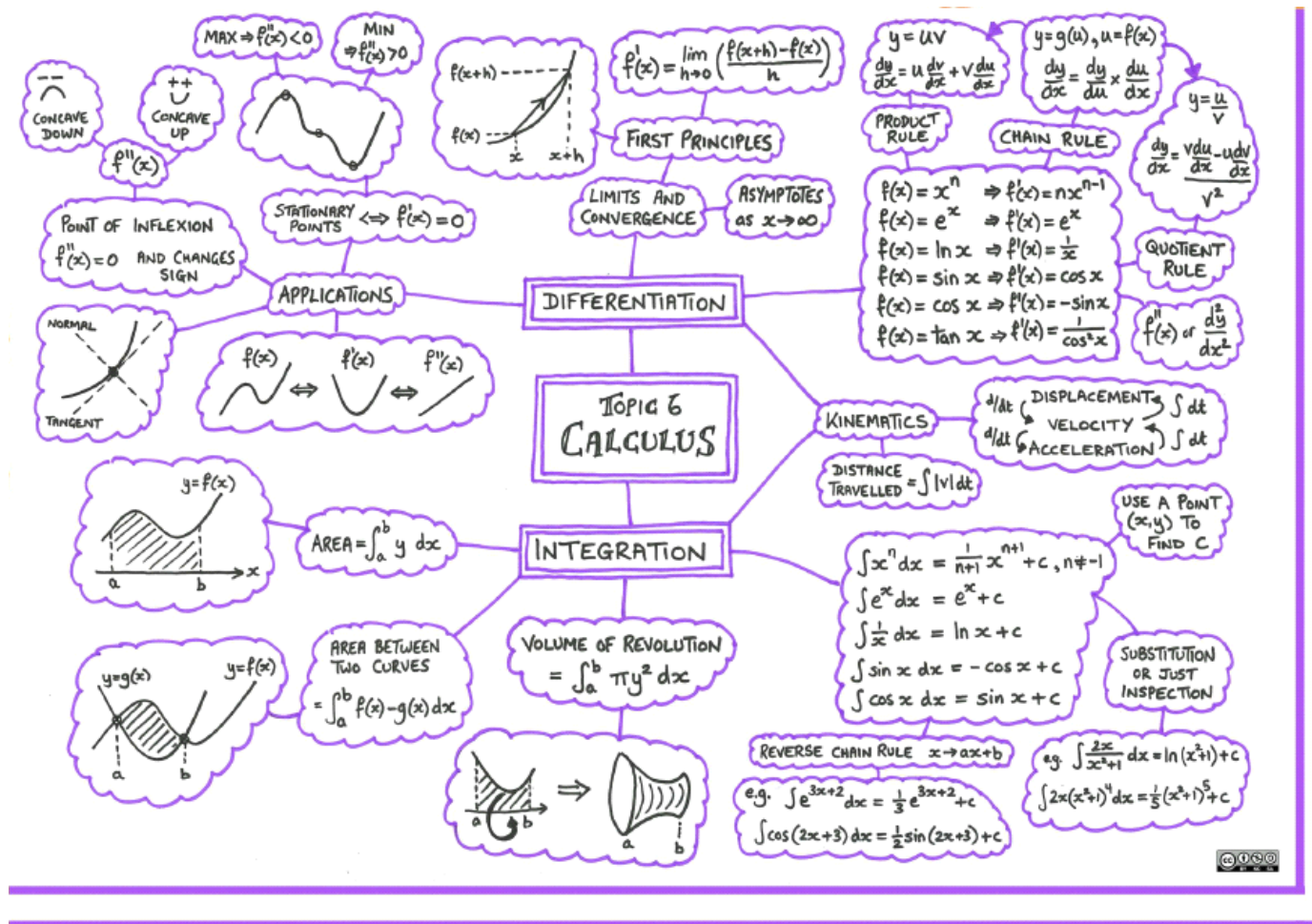


Gottfried Wilhelm Leibniz was the first to state clearly the rules of calculus.



Isaac Newton developed the use of calculus in his laws of motion and universal gravitation.

- Overview of Calculus & Analytical Geometry course



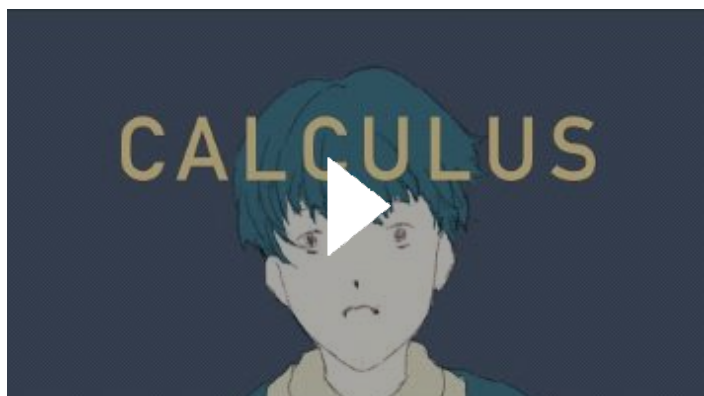
- **Application**

Calculus is applied in many areas of life. It can be used to model systems where there is change.

Examples of the applications of calculus in scientific fields are space exploration, telecommunications systems, computer science, engineering, medicine, pharmacology, business, meteorology, and music.

A video about calculus' application & Isaac Newton

[Calculus in a nutshell](#)





Discussion

