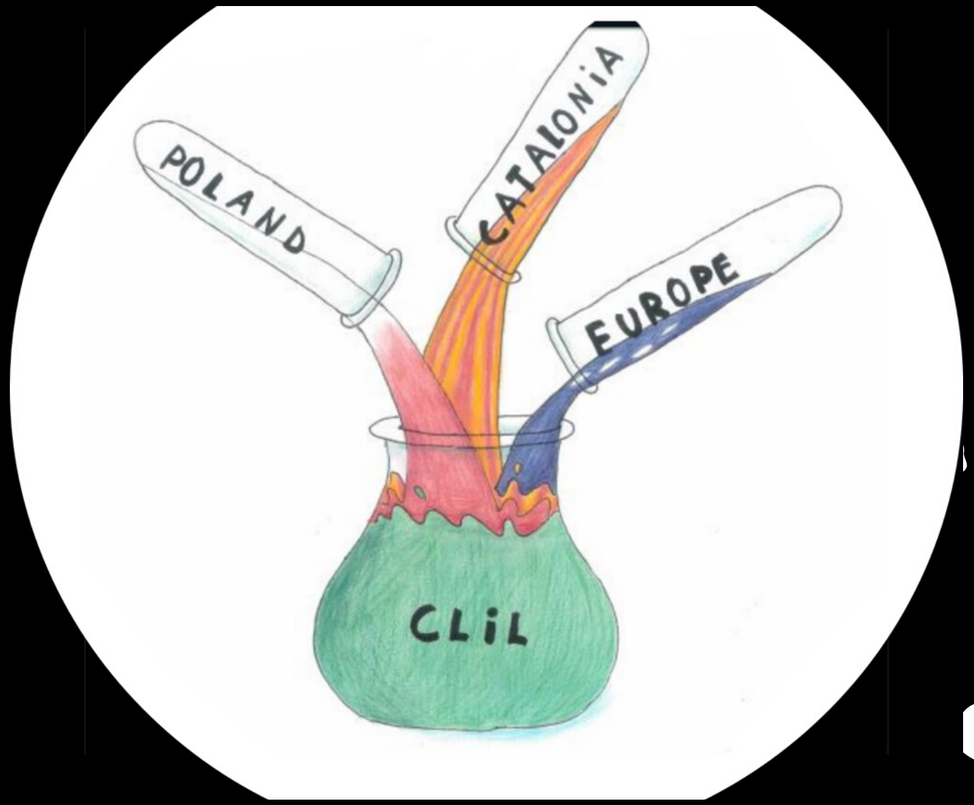


Famous Mathematicians

GALILEUSZ

DISCOVERIES

Laws of pendulum motion

In 1581, Galileo examined the laws of pendulum movement, observing the fluctuations of a lamp suspended on a long rope. He stated that the pendulum period depends only on the length of the pendulum and does not depend on the weight of the pendulum weight. This may seem trivial, but no one noticed it before Galileo. This statement was of great importance.

The law of free falling bodies

In 1600 Galileusz proved that the time of free fall does not depend on the mass of falling bodies. In 1602 he formulated the law of free falling of bodies. It was another momentous discovery!

PRINCIPLE OF INERTIA

He formulated the law that we now know as the first principle of dynamics - the principle of inertia.

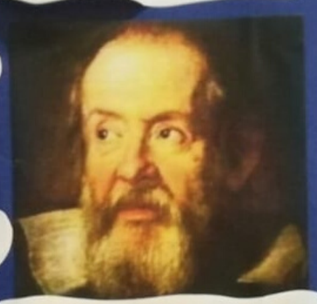
SOLAR SPOTS

Galileo also observed spots on the Sun, thanks to which he found that it rotates around its axis.

Galileo confirmed the heliocentric theory of Copernicus.

MOONS OF Jupiter

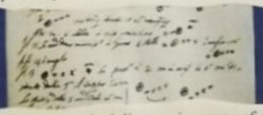
Galileo, using the telescope, discovered four moons of Jupiter: **Io**, **Europa** and **Callisto** and **Ganymede**. This discovery had a great impact on the philosophy of science - it showed that not all bodies in the Universe need to revolve around the Earth.



Date and place of birth: February 15, 1564, Pisa, Italy.

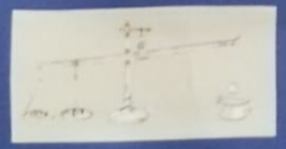
Date and place of death: January 8, 1642, Arcetri, Italy

Italian astronomer, astrologer, mathematician, physicist and philosopher, precursor of modern physics.



Galileo's astronomical discoveries were of epochal significance - they were an important contribution to the victory of Copernicus' theory and enabled the further development of observational astronomy.

Inventions



Hydrostatic balance:

In 1586, Galileo built a hydrostatic balance.

Geometric and military compass:

In the years 1595–1598, Galileo perfected the so-called "Geometric and military compass", suitable for use by surveyors and military personnel. With its help, it was possible to position the guns more accurately and to calculate the appropriate amount of gunpowder to fire a given cannonball.

THERMOMETER

Around 1606–1607 he constructed a thermometer using the thermal expansion of the substance.

TELESCOPE

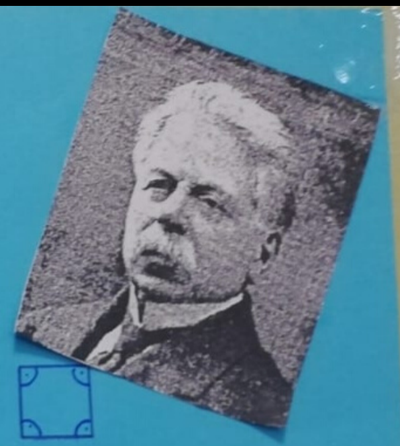
In 1609, the scholar constructed a telescope with 30x magnification, which he used to conduct astronomical observations.

SAMUEL DICKSTEIN

2+2=4

3+4=12

8²=64



He was born on the 12th of May the 1851 in Warsaw.
Polish mathematician, pedagogue, encyclopedist and historian of Jewish studies.
In 1875 he took the job of a professor at the University of Warsaw, he mainly dealt with number theory and algebra.
Founder and publisher of the magazine „Wiadomości Matematyczne"
He was one of the founders of a Jewish party „Zjednoczenie" advocating the assimilation of Jews in Poland.
In years 1888-1939 from the private fund he published the first Polish journal devoted to mathematics and physics „Prace Matematyczno-Fizyczne"

Achivments:

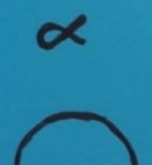
10-7=3

+ he led and created Polish mathematical terminology
- co-fander of the publishing house „Bibliotekі Matematyczno-Fizycznej"
x co-creator of the journal Prace Matematyczno-Przyrodnicze" of the first journal in Poland devoted to international mathematics and physics.
÷ he created a mathematical and physical circle which was a great important for Polish sciences.
= Creator and publisher of the magazine „Wiadomości Matematyczne"

x=2

x^3

Curiosities:
→ he contributed to the establishment of a network of meteorological stations in Poland.
→ founder of Warszawskie Towarzystwo Muzyczne.
→ co-founder Muzeu Tatrzańskiego w Zakopanem.
→ co-organized first in Poland Towarzystwo Ubezpieczeniowe „Powszechne"



30%

x-7=12

ISAAC NEWTON

★ BORN 25 DECENBER 1942
+ DIED 20 MARCH 1727

Newton was one of the most important scientist in a history.

-DISCOVERY OF THE GRAVITY
Newton had understood gravity as he was watching how apples fall down and one of them fell on his head, but it isn't true. Actually he was watching from the window how fruits were falling on the ground in the orchard when he came up with the idea.

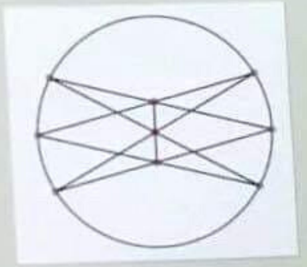
-ISAAC'S NOTE
Newton supposedly had a notebook in which he was writing down his sins and offenses.

He was :
-phisicist
-matchematican
-astronomer
-philosopher
-historian
-alchemist

-FIRE
Once upon a time a fire broke out in Newton's studio destroying 20 years of his research. Some say that it was his dog, Diamond, who caused the fire by hooking up the lamp, and others that he didn't have a dog and the lamp knocked down by the wind.

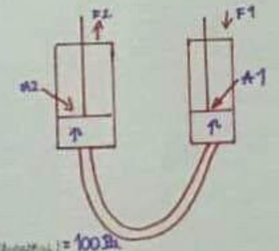
-PROCEEDINGS
Isaac was a member of parliament, but apparently he only spoke once and asked to close the window.

Zawdzięcie Pascala o ciśnieniu



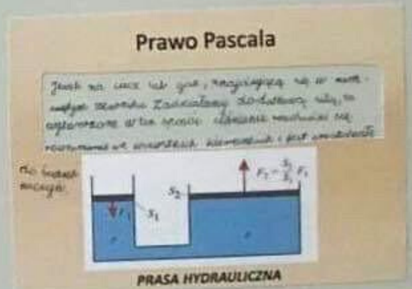
„Kropla miłości znaczy więcej niż ocean rozumu."
-Blaise Pascal

Pascal (Pa)



- 1hPa (Hektopaskal) = 100 Pa
- 1kPa (Kilopaskal) = 1000 Pa
- 1MPa (Megapaskal) = 1000 000 Pa

Jednostki ciśnienia



1MPa = 1000 000 Pa

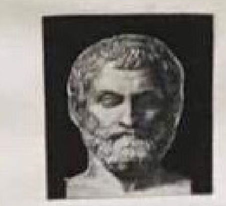
ALES

Tales (ok. 627 – ok. 5[illegible]0 p.n.e.)

Tales z Miletu [illegible] 28.05.585 r. p.n.e. [illegible]

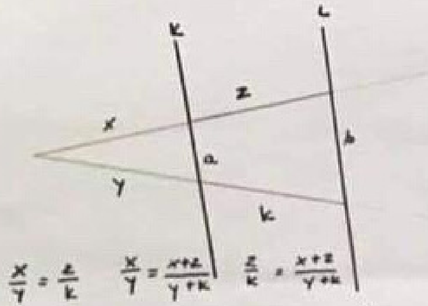
Definicja Twierdzenia TALESA

„[illegible]”



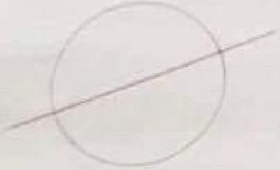
[illegible]

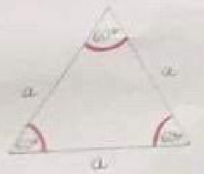
1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]



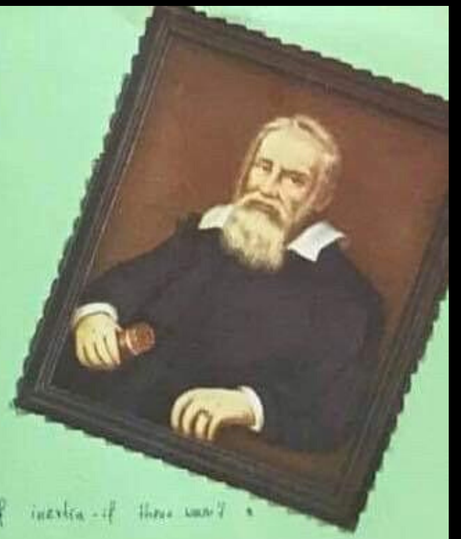
$$\frac{x}{y} = \frac{z}{k} \qquad \frac{x}{y} = \frac{x+z}{y+k} \qquad \frac{z}{k} = \frac{x+z}{y+k}$$

$$\frac{z}{x} = \frac{y}{k} \qquad \frac{x}{x+z} = \frac{y}{y+k} \qquad \frac{z}{x+z} = \frac{k}{y+k}$$





GALILEUSZ



Childhood

When Galileusz was 11 years old he started learning in religious school of the Jezuits in Santa Maria di Vallombrosa monastery. When he was 15, he wanted to be a monk but his father didn't agree to that and he took away him from there. In 1581 Galileusz began medical studies according to his father's will. He didn't finish them because he was more interested in mathematics. Later he became a lecturer in mathematics, on university in which he had been attending before. In 1592 he moved to a university in Padua and he was teaching geometry, mechanics and astronomy until 1610.

The most important information:

- He was born in 15 II of February in 1564 in Pisa
- He died in 8 th of January in 1642 in Arcetri
- His father was Vincenzo Galilei and he was music theoretician composer and god's fundamental
- His mother was Giulia Ammannati.

Professions: physicist, astronomer, philosopher, mathematician, philosopher.

He has never been married but with various women he had three children

Achievements:

Physics:

- he invented phenomenon of inertia - if there wasn't a rubbing there the body set in motion with constant speed
- pendulum vibration period from the amplitude

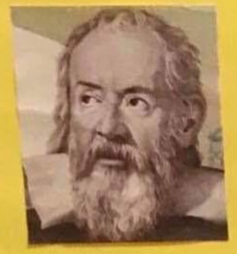
Astronomy:

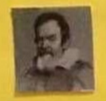
- he discovered sattelite's rings
- ~~sunspots~~
- Galaxy consist of many small stars
- Jupiter's moon: Io, Europe, Kallisto, Ganimedes

Technology:

- he improved geometric and military compass
- he constructed a thermometer and better than ever microscope

GALILEUSZ





TOP10 FACTS

1. Galileo originally began studying medicine, but switched to mathematics
2. Galileo's dad, Vincenzo, was a famous musician and composer
3. Galileo played the lute to a very high standard - his dad taught him!
4. There is a very famous play called 'Life of Galileo' by the German playwright Bertolt Brecht
5. Galileo was the first person to officially study the night sky with a telescope
6. Galileo was sent to prison for his scientific belief that the sun was at the centre of the solar system
7. It wasn't until 1992 that the catholic church officially cleared Galileo of wrongdoing for his scientific opinions
8. Galileo was the first person to spot the four moons of Jupiter - they are know as the Galilean moons
9. Galileo's first job was as an art teacher
10. Galileo discovered that our moon has mountains and craters

ABOUT

Born in Pisa, Italy, Galileo Galilei went to school at the Camaldulense Monastery. He began studying medicine in 1581 at the University of Pisa, before swapping to mathematics. He was fascinated by geometry and after his studies taught mathematics at both the University of Pisa and the University of Padua. During his time teaching, Galileo carried out lots of experiments exploring mechanics and the speed with which things fall. He was also interested in the way in which pendulums worked. Galileo developed many mathematical theories about motion and mechanics. He suggested that all things fall to the ground at the same speed, even though different masses. He also noticed that when things fall they accelerate in a constant way - he came up with the idea that the distance something falls is proportional to the time it falls for, squared. He also suggested that if something is moving along a flat surface, it will move at a constant speed unless something interferes with it - this went on to become Newton's first law of Motion. In 1609, Galileo developed the idea for a more powerful telescope after a Dutchman invented a low magnification telescope. In his lifetime he managed to improve the magnification of his telescope from 3x to 30x. Galileo used his telescope to study the sky and in 1610 he discovered the four moons that orbit Jupiter. As well as developing the telescope, Galileo invented many other things. He developed the geometric compass, a thermometer and a pendulum clock. Galileo went blind in his old age, but still managed to write and developed ideas. In 1638 his book explaining motion and mechanics 'Discourses Concerning Two New Sciences' was published. He died in 1642 at the age of 77.

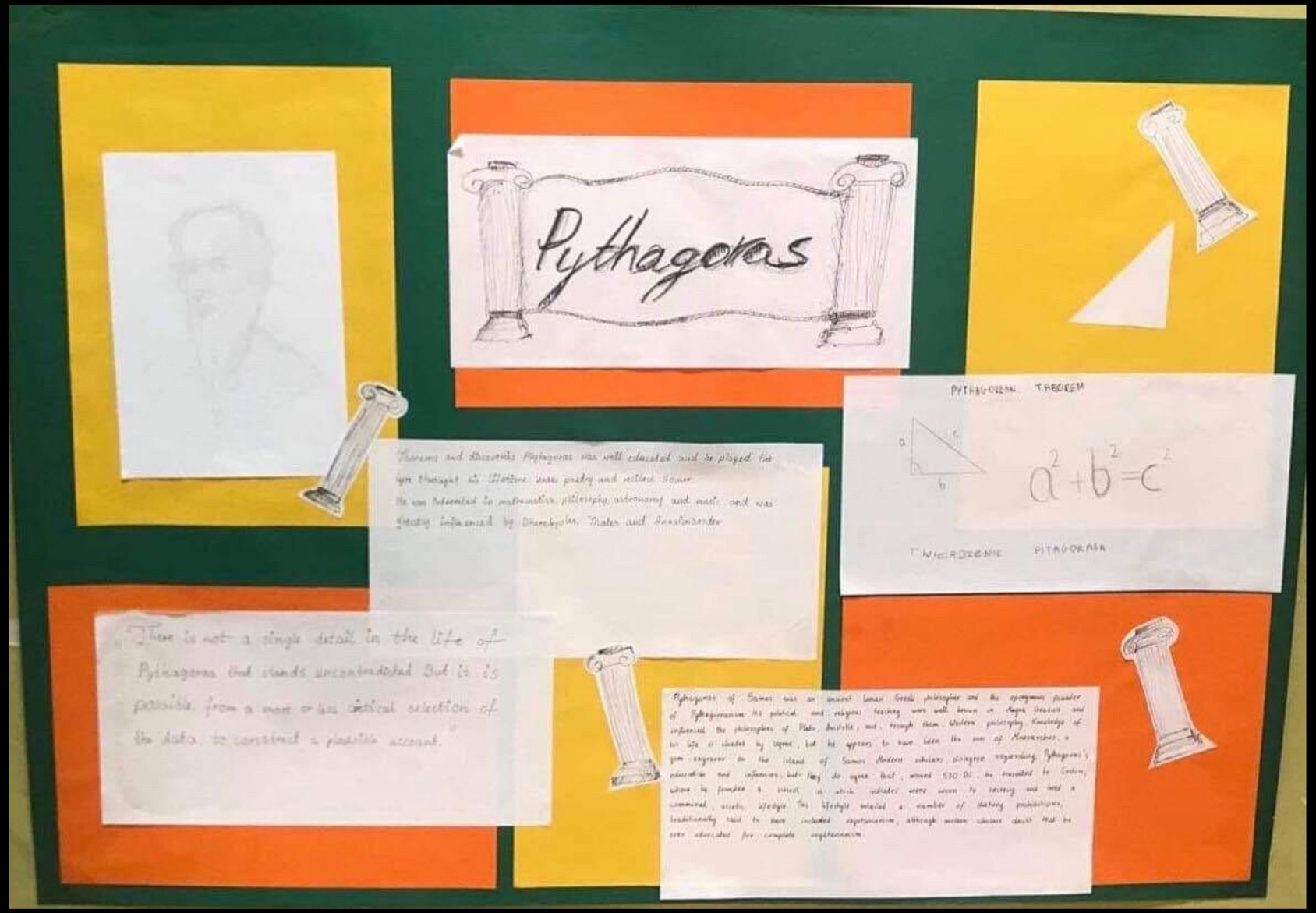
DID YOU KNOW?

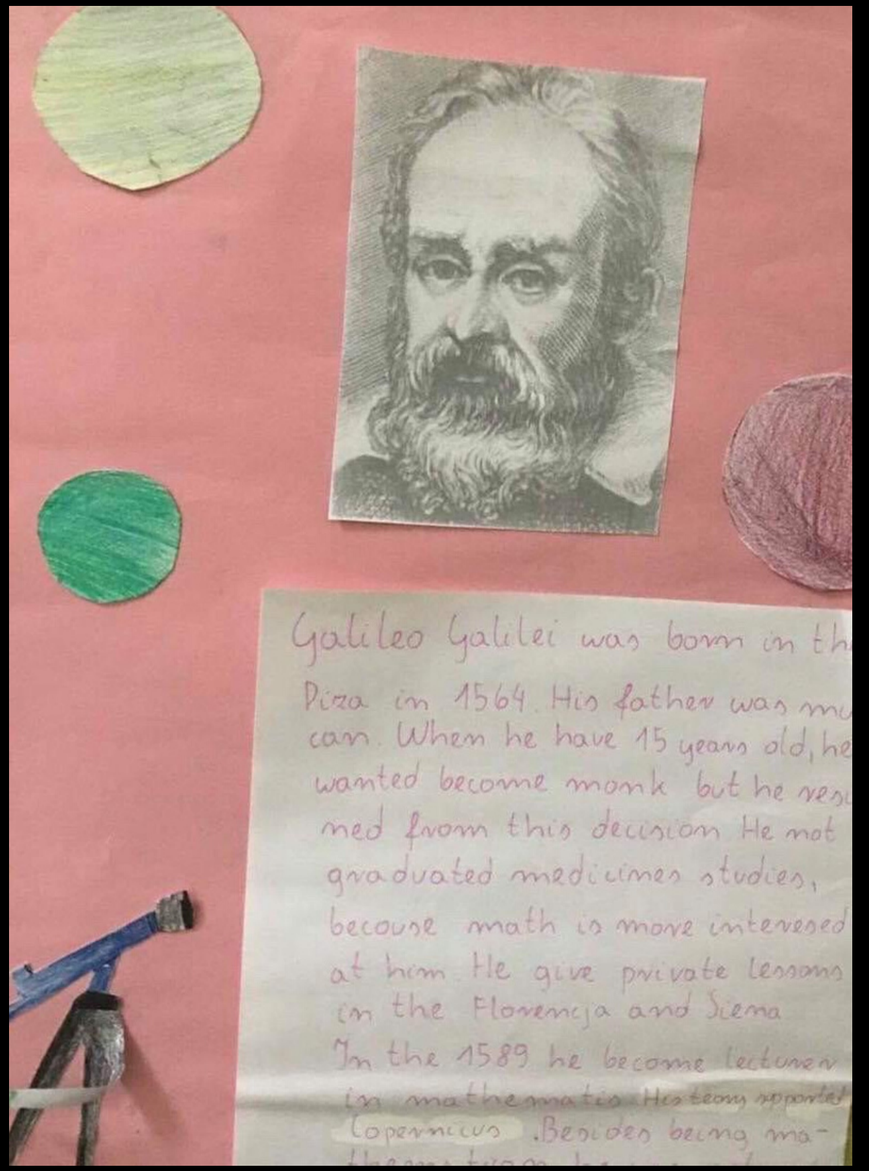
- While studying medicine Galileo decided to become a 'monk', but soon left the monastery he had joined in order to study mathematics. He became interested in mathematics after accidentally attending a lecture on geometry.

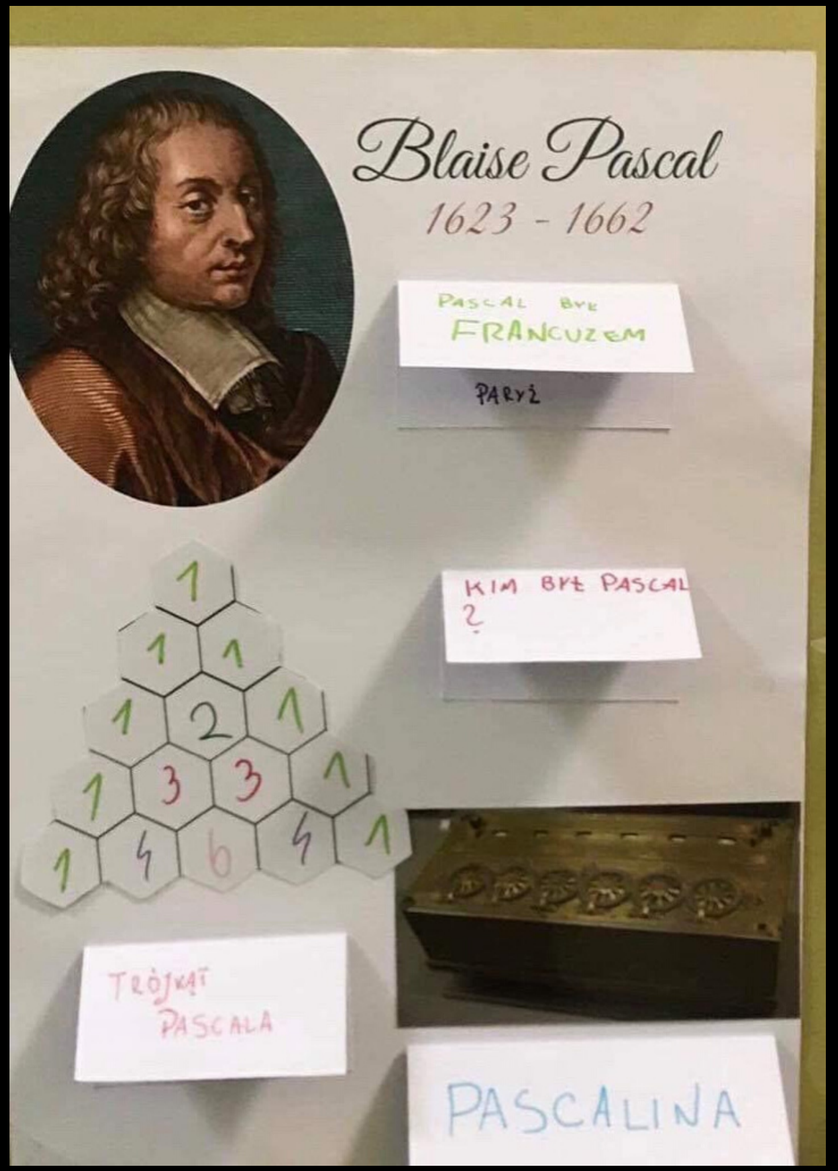
- Although Galileo never married he did have three children with a women called Marina Gamba - two daughters and a son. His two daughters became nuns and Galileo went to live with them at the convent where they lived.

- Galileo's approach to science was unusual at the time - scientists didn't generally carry out experiments to test out their theories. Effectively Galileo developed what we now know as 'the scientific method' of experimentation.

- As a young man, Galileo was fascinated by the pendulum movement of a chandelier he was watching. This ultimately led him to his work on pendulum clocks.


Pythagoras
Theorem and discoveries: Pythagoras was well educated and he played the lyre throughout his lifetime. Some poetry and writing survive.
He was interested in mathematics, philosophy, astronomy and music, and was greatly influenced by Phereckydes, Thales and Anaximander.
PYTHAGOREAN THEOREM
a
c
b
$a^2+b^2=c^2$
PITAGOREJEC PITAGORAVA
"There is not a single detail in the life of Pythagoras that stands uncontradicted. But it is possible, from a more or less critical selection of the data, to construct a possible account."
Pythagoras of Samos was an ancient Ionian Greek philosopher and the eponymous founder of Pythagoreanism. His political and religious teachings were well known in Magna Graecia and influenced the philosophers of Plato, Aristotle, and, through them, Western philosophy. Knowledge of his life is clouded by legend, but he appears to have been the son of Mnesarchus, a gem-engraver on the island of Samos. Modern scholars disagree regarding Pythagoras's education and influences, but they do agree that, around 530 BC, he travelled to Croton, where he founded a school in which initiates were sworn to secrecy and lived a communal, ascetic lifestyle. This lifestyle selected a number of dietary prohibitions, traditionally said to have included vegetarianism, although modern scholars doubt that he ever advocated for complete vegetarianism.


Galileo Galilei was born in th
Piza in 1564. His father was mu
can. When he have 15 years old, he
wanted become monk but he resi
ned from this decision He not
graduated medicines studies,
becouse math is more interesed
at him He give private lessons
in the Florencja and Siena
In the 1589 he become lecturer
in mathematic. His teory supported
Copernicus .Besides being ma-


Blaise Pascal
1623 - 1662
PASCAL BYŁ FRANCUZEM
PARYŻ
KIM BYŁ PASCAL ?
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
TRÓJKĄT PASCALA
PASCALINA

Quotes:

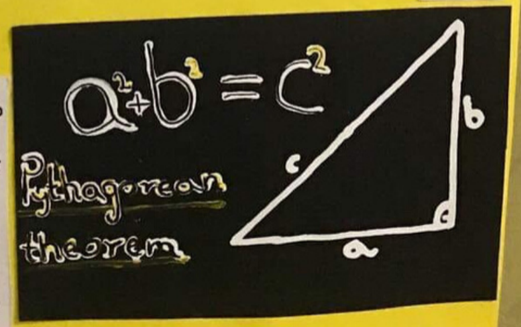
- „A friend is the one who is the other self. Just like 220 and 284."
- „Everything is a number."

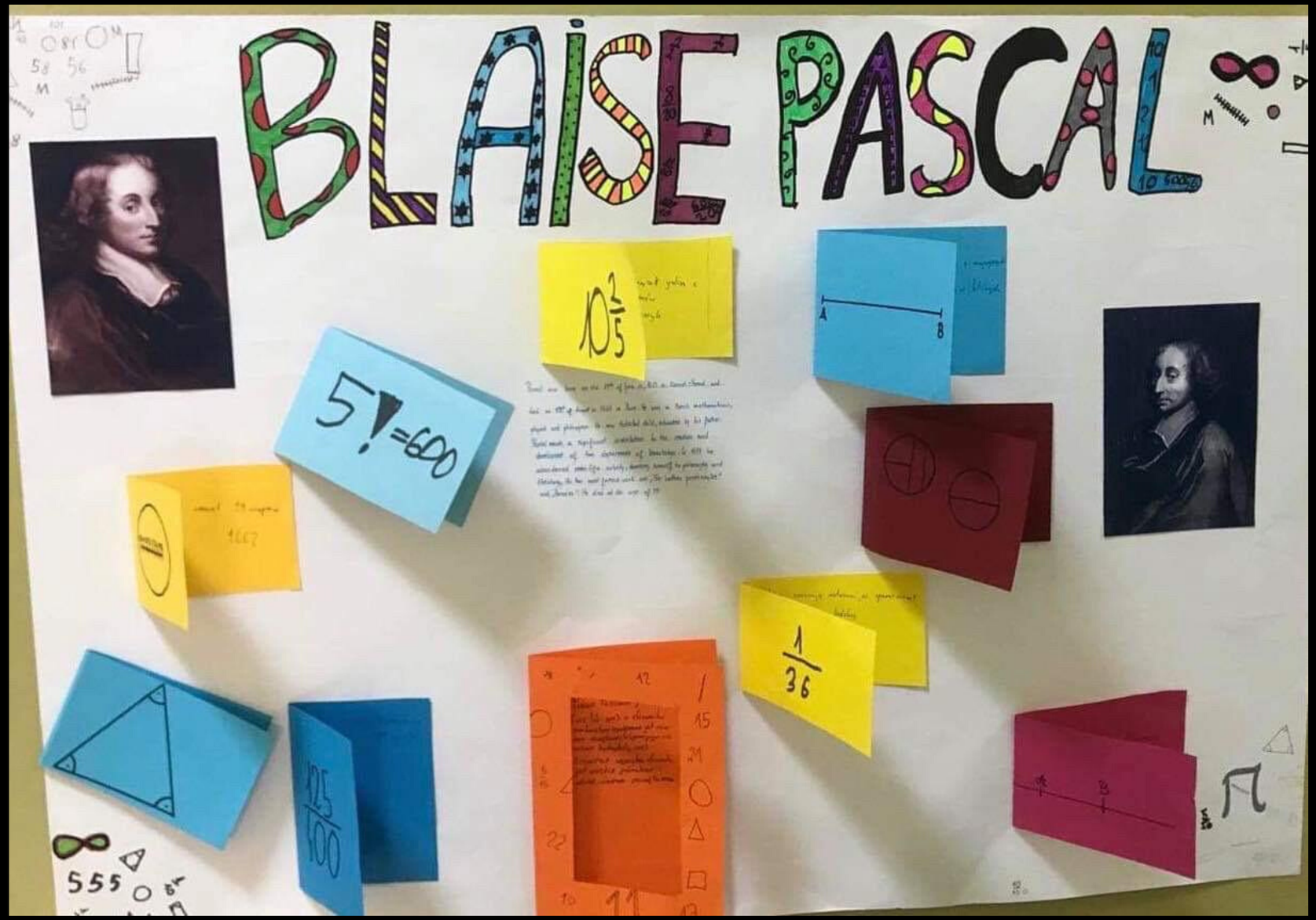
PYTHAGORAS

Pythagoras and his followers belived in the sanctity of numbers. They thought that numbers and equations stand behind the entire universe.

Pitagoras i jego wyznawcy wierzyli w świętość liczb. Uważali, że to liczby i równania stoją za całym wszechświatem.

*w naszej grupy matematyków




BLAISE PASCAL
5! = 600
10 2/5
A
B
1/36
125/100
555

Carl Friedrich Gauss

nieskończoność.....

minus

równa się

He was born on April 30, 1777 in Braunschweig, d. February 23, 1855 in Göttingen. German mathematician, physicist, astronomer. He is considered one of the greatest mathematicians. By his contemporaries he was called the "Prince of Mathematicians". His image was on a ten-Mark note

"Veili matematyka jest królową nauk, to królową matematyki jest teoria liczb"

$\pi = 3,1415...$

plus

2+2=?

Carl Friedrich G

0/0

procent

In 1807 he became a professor at the University of Göttingen and fulfills this function until his death. Hewas also the director of the astronomical observatory there, at which a geomagnetic laboratory was founded to study the Earth's magnetic elements. First discovery:

The first assumption of Gauss's mathematical discovery was to provide the structure of a seventeen-angle using a compass and a ruler, which he did in 1796.

razy

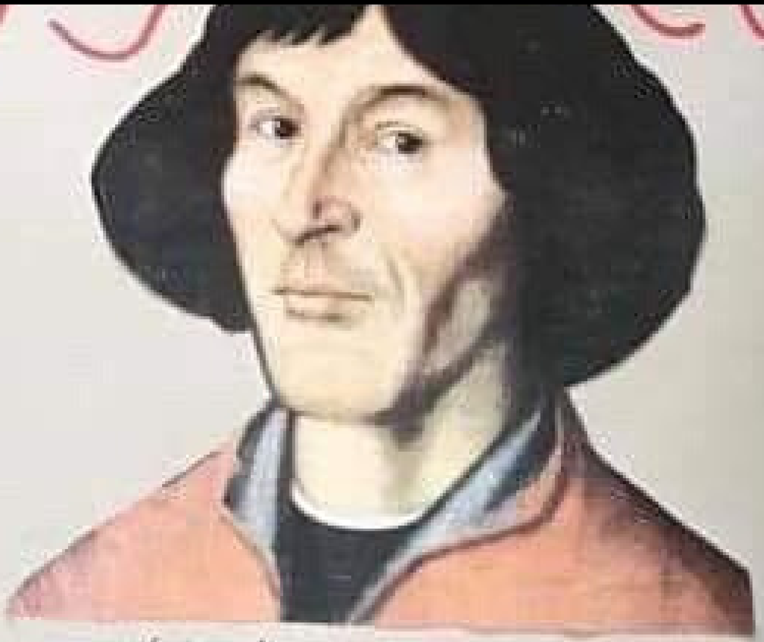
NICOLAUS COPERNICUS

(Mikołaj Kopernik)

(Jan Matejko's oil painting „Astronomer Copernicus, or Conversations with God")

MEDICINE IN COPERNICUS' LIFE

Copernicus began his medical studies in 1501 in Padua. Nicolaus studied two years and he [illegible] a bachelor's degree. This year him the opportunity to apply medical practice. Copernicus' patients were [illegible] and [illegible]. He was called to the sick people outside Warmia. Copernicus was [illegible] of [illegible]. Copernicus helped poor peasants in Warmian villages. Nicolaus didn't left any treatise or [illegible] his education about medicine.



Nicolaus Copernicus was born on 19 February 1473, and he died 24 May 1543. Copernicus lived his youth years in Toruń. He has very big family: mother Barbara, father Nicolaus sr, sister Katharina, sister Barbara jr and brother Andrew. He was great Polish astronomer, mathematician, economist, lawyer, strategist and physician. He created the theory of heliocentrism. „He stopped the Sun and moved the Earth, He was born of polish nation."

(one of the works of Nicolaus Copernicus)

(reconstruction of instruments for astronomy [illegible]

Copernicus - cartographer [illegible]
The Copernicus education [illegible]
for the preparation of maps [illegible]
Prussia. In 1510 [illegible] Nicol[illegible]
of the western border of [illegible]
Warmia. Another map was [illegible]
it covered the western part [illegible]
In 1526, the Copernicus [illegible]
Bernard Wapowski developed [illegible]
of Poland and the Grand [illegible]

(reconstruction of the Copernicus workshop in the Nicolaus Copernicus museum in Frombork)

Copernicus - economist
Nicolaus was also an economist. His writings on economist affairs, available for [illegible] accounting purposes, are [illegible] only for transcripts and translations were created in the years 1517-1528.

(different things in Nicolaus Copernicus museum [illegible]

De revolutionibus orbium coelestium (on the revolutions of the celestial spheres) Nicolaus Copernicus's work, which contains a lecture on the heliocentric and heliocentric structure of the universe. At that time it was a revolution in science and the worldview of [illegible]. Consists of six books and that was created in the years 1514-1533.

[illegible] [illegible], [illegible] [illegible]

Blaise Pascal

1
2 2
1 2 1

n = 2

1
3 3
3 6 3
1 3 3 1

n = 3

1
4 4
6 12 6
4 12 12 4
1 4 6 4 1

n = 4

Blaise Pascal was born on June 19, 1623 in the town of Clermont Ferrand. He was a French mathematician, physicist and philosopher. He was an extremely gifted child, educated by his father. His early works were created spontaneously, but significantly contributed to the development of science. He made a significant contribution to the design of mechanical calculators and fluid mechanics; he also clarified the concepts of pressure and vacuum, broadening Torricelli's work. In his studies he defended the scientific method. Pascal was above all a mathematician, he made a significant contribution to the creation and development of two new branches of knowledge. Already at the age of sixteen he wrote a thesis covering projective geometry issues, and later with Pierre de Fermat. He considered probability theory, having almost an influence on the development of modern economy and social sciences. Following the mystical experience he experienced in 1654, he abandoned scientific activity, devoting himself to philosophy and technology. Two of Pascal's most famous works come from this period of his life; Provincial Women and Thoughts. He struggled with health problems all his life; he died on August 19, 1662 in Paris. He was 39 years old.

Prawo Pascala

Jeżeli na płyn (ciecz lub gaz) w zbiorniku zamkniętym wywierane jest ciśnienie zewnętrzne, to (pomijając ciśnienie hydrostatyczne) ciśnienie wewnątrz zbiornika jest wszędzie jednakowe i równe ciśnieniu zewnętrznemu.

Pythagoras

Pythagoras – greek mathematical, philopher, mistyc well – know from his famous Pythagorean theorem. According too the most descriptions Pythagoras lived 80 years. Most people claim that Pythagoras died in Metapon in the hous of wrestler Milon.

Journeys – Jamblich described his journey to Egypt and his kidnapping to Babylon. He learnt maths. He went to Egypt at the instigation of Tales. He was his pupil. He in love of visdon was better than the others.

School – Pythagoras started his school in 529 before Christ (B.C) He was inheritor ideas Ferykedes from Syros and Hermodamas from Samos. For the all 509 B.C he was staying. Some say he was the only for forty days. He was teaching his listeners by symbols as Egyptians did. Pythagoras was follower of orphism. Pythagoras was imitator of Orpheus in way of speaking and thinking. The members of the community gave him glory. Pythagoras is credited Pythagorean theorem abaut rectangular squares.

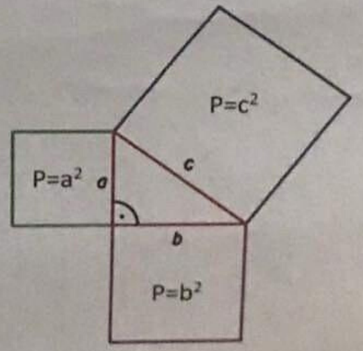
Views – Pythagoras religion was polytheistic.

Pythagoras theorem

The Pythagoras theorem is a relation among the three sides of right triangle:

the length of each angled triangle the square of the hypotenuse equals the sum of the squares of the hypotenuse

$$a^2 + b^2 = c^2$$



TWIERDZENIE PITAGORASA

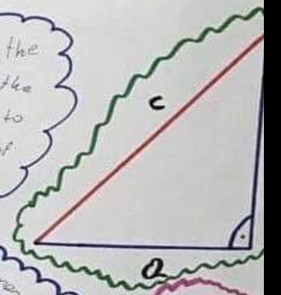
PYTHAGORE THEOREM

$a^2+b^2=c^2$

$a^2+b^2=c^2$

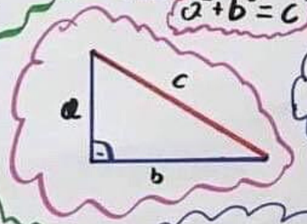
In any right triangle the sum of the squares of the side of the side is equal to the square of the side of the side of the triangle

$a^2+b^2=c^2$

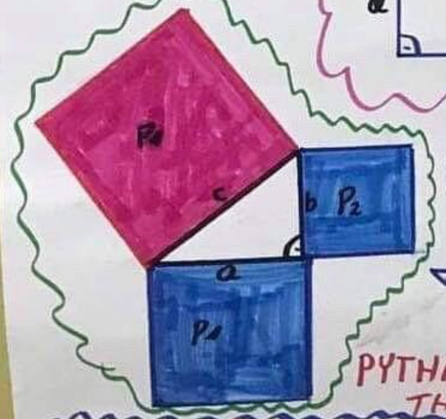


$a^2+b^2=c$

$P_1+P_2=P_3$



Pythagoras, the Greek mathematician and mystic philosopher associated with the famous mathematical theorem named after him according to most description, Pythagoras lived about 80 years



So if we build squares on the side of a rectangular triangle, the sum of the squares built on the side of this triangle will be equal to the area of the square built on the hypotenuse

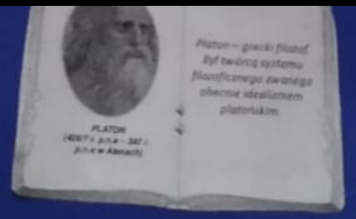
$P_1+P_2=P_3$

PYTHAGOREAN THEOREM

Pythagoras was born around 572 B.C. in Samos in Greece he grew up the spirit of
later, as a mathematician and philosopher he could not come to terms with the authorities
prevailing in Greece so he moved to Italy. Eventually he settled in Croton-his Pythagorean
group also operated there. Due to scientific activities he had an impact on
progress and in the field of astronomy. He was the creator of the life attitude called
In addition, his great achievements include the great achievements
theorem which although previously known to ancient
was the first in the European

Platon powiedziałby w sposób następujący: wszystko, co w świecie obserwujemy jest mniej lub bardziej sprawiedliwe, mniej lub bardziej dobre, piękne, kształtne, ale to wszystko może być takim tylko dzięki odniesieniu do czegoś absolutnego, czyli idei, inaczej formy wewnętrznej, czyli:

piękna w sobie, dobra w sobie, sprawiedliwości w sobie, białości w sobie, małość w sobie, wielkość w sobie itd.



Platon (427-347 r. p. n. e.)

Podstawa filozofii

Platon buduje swój system filozoficzny, tworząc trzy światy: świat rzeczy, które jest stale zmieniany, świat idei (Eidos) - wieczne i niezmienne, a pomiędzy nimi - obiekty matematyczne.

Poddał krytyce materializm pierwszych przyrodników: błąd pierwszych filozofów polegać miał na przyjętej metodzie (tzn. naiwny empiryzm)

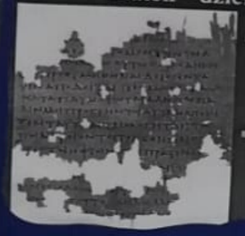
zadał sobie to samo pytanie, co wcześniejsi filozofowie, tzn. pytanie o przyczynę rzeczywistości:

dlaczego rzeczy powstają, giną, istnieją?

Platon - życie

- Syn Aristona i Periktiony
- Aristokles (= pełen cnót)
- Żył czasie rozkwitu Aten
- Piękny i silny zyskał sobie, w czasie ćwiczeń gimnastycznych, imię Platon (od πλατύς czyli barczysty)
- Przed spotkaniem Sokratesa pisał wiersze np. *Bajka o świerszczach*, ćwiczył się w malarstwie i muzyce.

Platon – dzieła



- Lutosławski ustalił porządek IV grup zastrzegając, że kolejność dialogów w grupach jest kwestią otwartą
- *Obrona Sokratesa, Eutyfron, Kriton, Charmides, Laches, Protagoras, Menon, Eutydem*

Platon – życie cd.

- Słuchał wykładów Kratylosa, czytał Anaksagorasa.
- Sokratesa spotkał mając 20 lat tj. w 407 r. - nie wiadomo jednak w jakich okolicznościach.
- Pozostawał przy Sokratesie 8 lat, aż do śmierci mistrza w 399 r.
- W tym czasie zetknął się z różnymi prądami w filozofii - Antystenes był cynikiem, Arystyp był cyrenaikiem. Euklides z Megary po części reprezentował statyzm Parmenidesa.

- **Mając lat 20, został uczniem Sokratesa;**
- **Uznał za swoją misję kontynuację działa mistrza;**
- **W 387 r. osiadł w Atenach, założył wówczas Akademię (zw. Platońską), która istniała prawie 900 lat;**
- **Geniusz metafor i mistrz pióra – autor 36 dialogów, które uchodzą również za dzieła literatury.**

Najważniejsze pojęcia w kontekście myśli Platona

Dualizm metafizyczny – stanowisko, zgodnie z którym istnieją dwie równoległe, „niesprowadzalne" do siebie (tzn. różne natury) rzeczywistości: materialna i idealna;

Idealizm metafizyczny – stanowisko, zgodnie z którym rzeczywistość idealna w hierarchii jest powyżej tej materialnej; tym samym jest przyczyną rzeczywistości widzialnej-materi

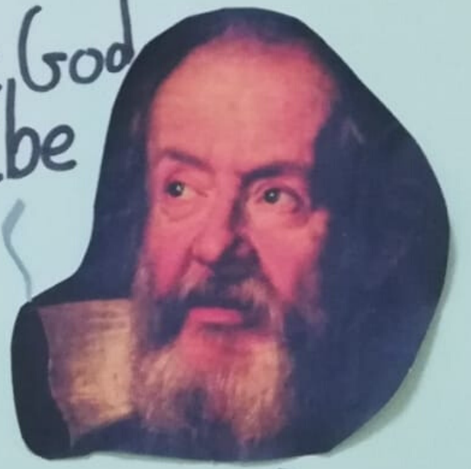
Racjonalizm (skrajny) epistemologiczny – stanowisko, zgodnie z którym poznanie świata idealnego (idei) może dokonywać się **wyłącznie** poprzez rozum (koncepcja oka umysłu oraz anamnezy);

Demiurg – to Platoński Bóg, jednak nie jako stwórca, lecz wyłącznie twórca rzeczywistości (nie stworzył świat, lecz tylko go uformował).

died

8 Janu

Mathematics is the "alphabet that God used to describe the universe"



discovery: Ganim
-des, Europe, Kallisto
lo, Saturn rings

Galileo

Italian astronomer, astrologer, mathematican, physicist and philosopher, precursor of modern physics

it's him

date and place of birth

February 15
1564, Pisa, Italy

Galileo

Galileo Life

Galileo Galilei was an Italian physicist and astronomer. He was born in Pisa on February 15, 1564. Galileo's father, Vincenzio Galilei, was a well-known musician. Vincenzio decided that his son should become a doctor.

In 1581, Galileo was sent to the University of Pisa to study medicine. While a student at the university, Galileo discovered that he had a talent for mathematics. He was able to persuade his father to allow him to leave the university to become a tutor in mathematics. He later became a professor of mathematics.

In 1609, Galileo heard about the invention of the spyglass, a device which made distant objects appear closer. Galileo used his mathematics knowledge and technical skills to improve upon the spyglass and build a telescope. Later that same year, he became the first person to look at the Moon through a telescope and make his first astronomy discovery. He found that the Moon was not smooth, but mountainous and pitted - just like the Earth! He subsequently used his newly invented telescope to discover four of the moons circling Jupiter, to study Saturn, to observe the phases of Venus, and to study sunspots on the Sun.

Galileo's observations strengthened his belief in Copernicus' theory that Earth and all other planets revolve around the Sun. Most people in Galileo's time believed that the Earth was the center of the universe and that the Sun and planets revolved around it.

The Catholic Church, which was very powerful and influential in Galileo's day, strongly supported the theory of a geocentric, or Earth-centered, universe. After Galileo began publishing papers about his astronomy discoveries and his belief in a heliocentric, or Sun-centered, Universe, he was called to Rome to answer charges brought against him by the Inquisition (the legal body of the Catholic Church). Early in 1616, Galileo was accused of being a heretic, a person who opposed Church teachings. Heresy was a crime for which people were sometimes sentenced to death. Galileo was cleared of charges of heresy, but was told that he should no longer publicly state his belief that Earth moved around the Sun. Galileo continued his study of astronomy and became more and more convinced that all planets revolved around the Sun. In 1632, he published a book that stated, among other things, that the heliocentric theory of Copernicus was correct. Galileo was once again called before the Inquisition and this time was found guilty of heresy. Galileo was sentenced to life imprisonment in 1633. Because of his age and poor health, he was allowed to serve his imprisonment under house arrest. Galileo died on January 8, 1642.

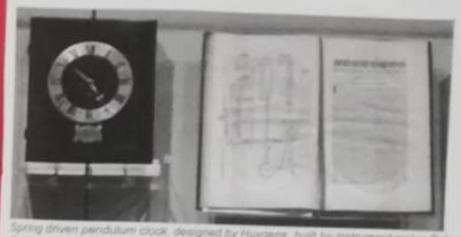
What Did Galileo Invent?

Galileo is considered one of the greatest astronomers of all time. His discovery of Jupiter's major moons (Io, Europa, Ganymede and Callisto) revolutionized astronomy and helped speed the acceptance of the Copernican Model of the universe. However, Galileo is also known for the numerous scientific inventions he made during his lifetime.

These included his famous telescope, but also a series of devices that would have a profound impact on surveying, the use of artillery, the development of clocks, and meteorology. Galileo created many of these in order to earn extra money to support his family. But ultimately, they would help cement his reputation as the man who challenged centuries worth of previously-held notions and revolutionized the sciences.

Pendulum Clock:

During the 16th century, Aristotelian physics was still the predominant way of explaining the behavior of bodies near the Earth. For example, it was believed that heavy bodies sought their natural place or rest – i.e at the center of things. As a result, no means existed to explain the behavior of pendulums, where a heavy body suspended from a rope would swing back and forth and not seek rest in the middle.



Spring driven pendulum clock, designed by Huygens, built by instrument maker Salomon Coster (1657),[96] and copy of the Horologium Oscillatorium,[97] Museum Boerhaave, Leiden

Already, Galileo had conducted experiments that demonstrated that heavier bodies did not fall faster than lighter ones – another belief consistent with Aristotelian theory. In addition, he also demonstrated that objects thrown into the air travel in parabolic arcs. Based on this and his fascination with the back and forth motion of a suspended weight, he began to research pendulums in 1588.

In 1602, he explained his observations in a letter to a friend, in which he described the principle of isochronism. According to Galileo, this principle asserted that the time it takes for the pendulum to swing is not linked to the arc of the pendulum, but rather the pendulum's length. Comparing two pendulum's of similar length, Galileo demonstrated that they would swing at the same speed, despite being pulled at different lengths.

According to Vincenzo Vivian, one of Galileo's contemporaries, it was in 1641 while under house arrest that Galileo created a design for a pendulum clock. Unfortunately, being blind at the time, he was unable to complete it before his death in 1642. As a result, Christiaan Huygens' publication of *Horologium Oscillatorium* in 1657 is recognized as the first recorded proposal for a pendulum clock.

Hydrostatic Balance:

Inspired by the story of Archimedes' and his "Eureka" moment, Galileo began looking into how jewelers weighed precious metals in air, and then by displacement, to determine their specific gravity. In 1586, at the age of 22, he theorized of a better method, which he described in a treatise entitled *La Bilancetta* (or "The Little Balance").

In this tract, he described an accurate balance for weighing things in air and water, in which the part of the arm on which the counter weight was hung was wrapped with metal wire. The amount by which the counterweight had to be moved when weighing in water could then be determined very accurately by counting the number of turns of the wire. In so doing, the proportion of metals like gold to silver in the object could be read off directly.

Galileo's Pump:

In 1592, Galileo was appointed professor of mathematics at the University of Padua and made frequent trips to the Arsenal – the inner harbor where Venetian ships were fitted out. The Arsenal had been a place of practical invention and innovation for centuries, and Galileo used the opportunity to study mechanical devices in detail.

In 1593, he was consulted on the placement of oars in galleys and submitted a report in which he treated the oar as a lever and correctly made the water the fulcrum. A year later the Venetian Senate awarded him a patent for a device for raising water that relied on a single horse for operation. This became the basis of modern pumps.

To some, Galileo's Pump was a merely an improvement on the Archimedes Screw, which was first developed in the third century BCE and patented in the Venetian Republic in 1587. However, there is apparent evidence connecting Galileo's invention to Archimedes earlier and less sophisticated design.

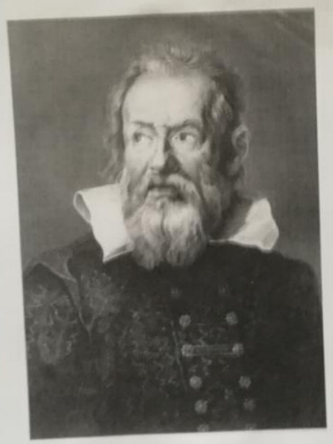
GALILEO GALILEI

alileo validated heliocentric theory of Copernicus.

Galileo stated the law of falling bodies.

He made geometric and military compass.

Galileo had three children.



He created the solar planet model using a telescope he built himself. He discovered four moons revolving around Jupiter.

In 1589 Galileo became a lecturer at the University of Pisa then he moved to the Padua University where he did lectures on geometry and astronomy.

In 1610 Galileo published his work Sidereus Nuncius which contradicted the Aristotelian worldview.

When he was seventeen he started to study medicine at the University of Pisa. But he prefered maths to medicine.

In 1633 the Catholic Church found Gal guilty of heresy and sentenced him t house imprisonment. He was also forc to abandon his heliocentric views.

When Galileo was eleven he went to Jesuit school and he wanted to become a monk.

Galileo Galilei died in Arcetri in 1642.

Galileo Galilei was born on 15th February 1564 in Piza.