Fibonacci sequence and golden ratio pdf

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This article is about the issue. For the Album Ace of Base, see The Golden Ratio. For calendar dates, see The Golden Number (Time). The ratio between the two quantities the sum of which is in the same relation to the larger segments of the line in the gold ratio Golden rectangle with a longer side a and a shorter side b, when placed next to the square with the sides of length A, will produce a similar golden rectangle with a longer side a b and a shorter side a ≡ φ. In mathematics, two quantities are in gold ratio, if their ratio is equal to the ratio of their sum to the larger of the two quantities. The figure on the right illustrates a geometric connection. Expressed algebraically, for quantities a and b with a > b > 0, a + b a = a b = def φ , {\displaystyle {\frac {a+b}{a}}={\frac {a}{b}}\ {\stackrel {\text{def}}{=}}\ \varphi ,} where the Greek letter phi (φ {\displaystyle \varphi } or φ {\displaystyle \phi }) represents the golden ratio. This is an irrational number that is the solution to the square equation x 2 x x x 1 x 0 display style x {2}-x-10 , with a value: φ 1 5 2 1,6180339887 ... . Display style warfi frak 1 sqrt {5} {2} 1.6180339887'ldots. The golden ratio is also called the golden middle or gold section (Latin: sectio aurea). Other names include extreme and middle ratio, medial section, divine proportion (Latin: proportio divina), divine section (Latin: sectio divina), golden proportion, gold cut and golden number. Mathematicians from the time of Euclid have studied the properties of the gold ratio, including its appearance in the size of a conventional pentagonal and gold rectangle, which can be cut into a square and a smaller rectangle with the same ratio of sides. The gold ratio has also been used to analyse the proportions of natural objects as well as human-made systems, such as financial markets, in some cases based on questionable approaches to data. The golden ratio is evident in some patterns in nature, including the spiral arrangement of leaves and other plant parts. Some artists and architects of the twentieth century, including Le Corbusier and Salvador Dali, proportion their works to approximate the golden ratio, believing that it is aesthetically pleasing. They often appear as a golden rectangle, in which the ratio of the longer side to the shorter is the golden ratio. Calculate List of Numbers Irrational Numbers ζ (3) √2 √3 √5 φ e π Binary 1.10011100011111... Decimal 1.618033988749894848882... Hexadecimal 1.9E3779B97F4A7C15F39... Continuation faction 1 1 1 1 1 1 1 1 1 ⋱. display 1 cfrac {1} 1 cfrac {1} 1'cfrac {1} 1cfrac {1} 1ddots Albrageic form 1 and 5 2 display (1 sq.m. {5}) {2}- The Greek letter phi symbolizes the golden ratio. Typically, a lower register form (φ or φ) is used. Иногда форма верхнего регистра (Φ (дисплей)Phi) используется для взаимного золотого соотношения, φ φ 1/φ. «Дисплей стиль »фрак »а-б»а-фрак (а-б'б'варфи. Один из методов определения ценности φ начать с левой фракции. Упрощая фракцию и заменяя b/a 1/φ, a b a a a b a 1 b a 1 и 1 и 1 φ . Displaystyle frak a-b-a-frak (a-a-frak) b-a-1-frak (b-a)-frak {1} warfi. Thus, 1 and 1 φ and φ. Displaystyle 1 {1} Warfi. Multiplying by φ gives φ 1 and φ 2 display (varphi) 1varphi ({2}), which can be replaced on φ 2 φ 1 0. Warfi-style display {2}-Warfi -10. Using the square formula, two solutions are obtained: 1 and 5 2 and 1,618 033 988 7 ... Display-style frak 1sqrt {5} {2} 1.618,033,988,7 points and 1 5 2 0.618 033 988 7 ... Display-style frak 1-sqrt {5} {2}-0.618',033,98'7'dots Since φ is the ratio between positive quantities, φ necessarily positive: φ Nos. 1 and 5 2 and 1.61803 39887 ... Display style warfi frak 1sqrt {5} {2} 1.61803,39887 Points History See also: Mathematics and Art and Fibonacci Number - History According to Mario Livio, Some of the greatest mathematical minds of all ages, from Pythagoras and Euclid in ancient Greece, through the medieval Italian mathematician Leonardo Pisa and Renaissance astronomer Johannes Kepler, to modern scholars such as Oxford physicist Roger Penrose, have spent endless hours over this simple ratio and its properties. ... Biologists, artists, musicians, historians, architects, psychologists and even mystics pondered and discussed the basics of its ubiquity and attractiveness. In fact, it is probably fair to say that the Golden Ratio has inspired thinkers of all disciplines like no other number in the history of mathematics. Golden ratio: The history of 2, the most surprising number of ancient Greek mathematicians in the world, first studied what we now call the gold ratio, because of its frequent appearance in geometry; Dividing the line into an extreme and middle ratio (golden section) is important in the geometry of conventional pentagrams and pentagons. According to one of the stories, the mathematician HIPpasus of the 5th century BC found that the gold ratio was neither a whole number nor a share (irrational number), surprising the Pythagores. The elements of Euclid (c. 300 BC) contain several sentences and their evidence using the gold ratio, and contains its first known definition, which continues as follows: and the average ratio, when, like the whole line to a larger segment, and more to a smaller one. Michael Meistlin, the first to write the decimal approximation of the Gold Ratio ratio, was studied peripherally over the next millennium. Abu Kamil (about 850-930) used it in his geometric calculations of the pentagons and decagon; his writings influenced Fibonacci (Leonardo Pisa) (c. 1170-1250), who used the ratio in geometry-related problems, although he never associated it with a series of numbers named after him. Luca Pacioli named his book Divina proportione (1509) after the ratio and explored its properties, including its appearance in some of the platonic solids. Leonardo da Vinci, who illustrated the above book, called the ratio sectio aurea (golden section). Mathematicians of the 16th century, such as Raphael Bombelli, solved geometric problems with a ratio. The German mathematician Simon Jakob (d. 1564) noted that the successive numbers of Fibonacci converge with the golden ratio; It was rediscovered by Johannes Kepler in 1608. The first known decimal approximation of the (reverse) gold ratio was declared as about 0.6180340 in 1597 by Michael Meistlin of the University of Tubingen in a letter to Kepler, his former student. In the same year, Kepler wrote Meistlin from the Kepler triangle, which combines the golden ratio with the Pythagorean theorem. Kepler said this: Geometry has two great treasures: one Theophagoras theorem, the other dividing the line into an extreme and an average ratio. The first we can compare with the mass of gold, the second we can call a gem. Mathematicians of the 18th century Abraham de Moyvre, Daniel Bernoulli and Leonhard Euler used a formula based on the gold ratio, which finds the value of the number of Fibonacci based on its placement in sequence; In 1843 it was rediscovered by the South by Philippe Marie Binet, for whom he was called the Binet Formula. Martin Om first used the German term goldener Schnitt (golden section) to describe the ratio in 1835. James Sully used the equivalent English term in 1875. By 1910, mathematician Mark Barr began to use the Greek letter Phi (φ) as a symbol of the gold ratio. It was also presented by tau (I), the first letter of the ancient Greek language τομή cut or section). Between 1973 and 1974, Roger Penrose developed penrose tiles, a model associated with the gold ratio both in the ratio of areas of two diamond tiles and in their relative frequency within the pattern. This led to Dan Shechtman's discovery in the early 1980s of quasi-crystal, some of which demonstrate icosahedar symmetry. Applications and Observation Architecture Additional information: Mathematics and Architecture Minaret, as seen from the courtyard of the Great Mosque of Kairouan A 2004 Earlier research at the Great Kairouan Mosque (670) shows the application of the gold ratio in much of the design. They found ratios close to the golden ratio in the overall layout and size of the prayer space, the court and the minaret. However, areas with ratios close to the gold ratio were not part of the original plan and were probably added to the reconstruction. It was assumed that the gold ratio was used by the designers of Naksh-e-Jahan Square (1629) and the adjacent Lotfall Mosque. Swiss architect Le Corbusier, known for his contribution to contemporary international style, has focused his design philosophy on systems of harmony and proportions. Le Corbusier's belief in the mathematical order of the universe was closely related to the golden ratio and the Fibonacci series, which he described as rhythms obvious to the eyes and clear in their relationship with each other. And these rhythms are at the very root of human activity. They sound in man of organic inevitability, the same beautiful inevitability that evokes the search from the Golden Section of children, the elderly, savages and scientists. Le Corbusier clearly used the gold ratio in his Modulor system for the scale of architectural proportion. He saw this system as a continuation of the long tradition of Vitruvia, Leonardo da Vinci's Vitruvian Man, the work of Leon Battista Alberti and others, who used the proportions of the human body to improve the appearance and function of architecture. In addition to the gold ratio, Le Corbusier based the system on human measurements, Fibonacci numbers and double unit. He accepted the offer of a golden ratio in human proportions to the extreme: he divided the height of his model human body on the navel with two sections in gold ratio, and then subdivided these sections in gold ratio to the knees and throat; he used these golden ratio proportions in the Modulor system. Le Corbusier 1927 Villa Stein in Garces exemplifies the application of the Modulor system. The rectangular plan of the villa's land, height and internal structure are closely approximated by the golden rectangles. Another Swiss architect, Mario Botta, bases many of his designs on geometric shapes. Several private houses he designed in Switzerland consist of squares and circles, cubes and cylinders. In the house he designed in Origlio, the golden ratio is the proportion between the central section and the side sections of the house. Artistic additional information: Mathematics and art and history of aesthetics until the 20th century Leonardo illustration dodecaedre of Divina proportions of Pacioli (1509) Divina proportions (Divine proportion), a three-volume work by Luca Pacioli, was published in 1509. Pacholy, a Franciscan monk, was known mainly as a mathematician, but he was also trained and keenly In art. Divin's proportion researched the mathematics of the gold ratio. Although it is often said that Pacioli advocated the application of the golden ratio to give pleasant, harmonious proportions, Livio points out that the interpretation was traced back to error in 1799, and that Pacioli actually advocated a Vitruvia system of rational proportions. Pacioli also saw Catholic religious significance in the ratio that led to the title of his work. Leonardo da Vinci's illustrations of multiedra in Divin's proportion led some to speculate that he had incorporated the golden ratio into his paintings. But the assumption that his Mona Lisa, for example, uses golden ratio proportions is not supported by Leonardo's own writings. Similarly, although the Vitruvian man is often shown in connection with the gold ratio, the proportions of the figure do not actually match him, and the text mentions only whole ratios of numbers. Salvador Dali, influenced by the works of Matila Gyka, clearly used the gold ratio in his masterpiece The Mystery of the Last Supper. The size of the canvas is a golden rectangle. Huge dodecachedron, in perspective so that the edges appear in the gold ratio to each other, pauses above and behind Jesus and dominates the composition. A statistical study of 565 works of art by various great artists conducted in 1999 showed that these artists did not use the gold ratio in the size of their paintings. The study concluded that the average ratio of the two sides of the paintings studied was 1.34, with averages for individual artists varying from 1.04 (Goya) to 1.46 (Bellini). On the other hand, Pablo Tosto has listed more than 350 works by famous artists, including more than 100 that have canvases with a golden rectangle and root-5 proportions, and others with proportions like root-2, 3, 4 and 6. An image of proportions in a medieval manuscript. In the words of Jan Tschichold: Page proportions 2:3. Margin proportions 1:1:2:3. Text the area of proportion in the Golden section. Books and Design Home article: Canons of Page Building According to Jan Tschichold, There was a time when deviations from the really beautiful proportions of page 2:3, 1:√3, and the Golden section were rare. Many books produced between 1550 and 1770 show these proportions accurately, within a half-millimeter. According to some sources, the gold ratio is used in everyday design, for example, in proportions of playing cards, postcards, posters, light plates and widescreen televisions. The music of Erne Lendvay analyzes Bela Bartok's work as based on two opposing systems, the gold ratio and the acoustic scale, although other music scholars reject this analysis. French composer Eric Satie used the gold ratio in several of his Ringtones of the The golden ratio is also evident in the organization of sections in music by Refletts Dans l'eau Debussy (Reflections in Water), from the images (1st series, 1905), in which the sequence of keys is marked at intervals 34, 21, 13 and 8, and the main climax sits in the position of phi. Musicologist Roy Howat noted that la Mer Debussy's formal boundaries are exactly the same as the golden section. Trezezee considers the internal evidence remarkable, but warns that no written or presented evidence indicates that Debussy knowingly sought such proportions. Pearl Drums position the vents on their Masters Premium models based on the gold ratio. The company claims that this arrangement improves the bass response and has applied for a patent for this innovation. Although Heinz Bolen offered an 833-cent non-100-cent scale based on combined tones, the setting has a relationship based on the gold ratio. As a musical interval, the ratio is 1.618... is 833,090... (Play (help)). The natural detail of the saucer plant, Aeonium tabuliforme, showing the multiple spiral arrangement (parasty) Main article: Patterns in Nature See also: Fibonacci room - Nature Johannes Kepler wrote that the image of a man and a woman stems from divine proportion. In my opinion, the spread of plants and the progenitive actions of animals are in the same ratio. Psychologist Adolph Seising noted that the golden ratio appeared in phyllokaxis and argued from these patterns in nature that the gold ratio is a universal law. In 1854, Seising wrote the universal orthogenetic law of the pursuit of beauty and fullness in the realms of nature and art. In 2010, the journal Science reported that the gold ratio is present at the atomic scale in the magnetic resonance of spins in the crystals of cobalt niobate. However, some argue that many of the obvious manifestations of the golden ratio in nature, especially in relation to the size of animals, are fictional. Optimizing the Golden Ratio is the key to finding the golden section. Mathematics Irrationality Golden Ratio is an irrational number. Below are two brief proofs of irrationality: Contradictions from expression in the lowest terms If φ were rational, it would be the ratio of the sides of the rectangle on the whole side (a rectangle consisting of the entire diagram). But it will also be the ratio of the more complex sides of the smaller rectangle (the most right part of the chart) obtained by removing the square. The sequence of side length reductions formed by removing squares cannot be continued indefinitely because the integrators have a lower boundary, so the φ cannot be rational. Recall that: in general, this is a longer part plus more Part of it all to the longer part as a longer part to the shorter part. If we name the whole and The longer part of m, then the second statement above becomes n to m as m to n m, or, algebraically n y n y m. (∗) display frak n'mfrac (m'n-m'.qquad) To say that the gold ratio of φ is rational means that φ is a fraction of n/m. We can take n/m to be in the lowest conditions and n and m to be positive. But if n/m is in the lowest terms, the identity marked (I) above speaks m/(n q m) in still lower terms. This is a contradiction that stems from the assumption that φ is rational. Irrationality √5 Another short evidence, perhaps more widely known - the irrationality of the gold ratio, uses the closing of rational numbers when added and multiplied. If 1 x 5 2 display (text style) frac (1) sqrt {5}{2}) is rational, Then 2 (1 x 5 2) - 1 - 5 display style 2 left (frac 1 sqrt {5} {2})-1sqrt {5} also rationally, which is a contradiction if already known that the square root of a non-square natural number is irrational. The minimum polynomial gold ratio is also an algebraic number and even an algebraic insion. It has a minimal polynomial x 2 x x 1. Display style x {2}-x-1. Having a degree 2, this polynomial actually has two roots, another gold conjugation factor. The gold ratio to conjugate conjugated root with minimal polynomial x2 x No 1 is 1 φ 1 - φ 1 - 5 2 - 0.61803 39887 .... Display-frak {1} Warfi 1-Warfi frak 1-sqrt {5} {2}-0.61803,39887dots. The absolute value of this amount (≈ 0.618) corresponds to the ratio of length taken in reverse order (short segment length over the longer segment length, b/a), and is sometimes called the gold ratio, conjugation or silver factor. (e) It is designated here by the capital of Phi (Φ display Phi): Φ No. 1 φ φ 1 0.61803 39887 ... . Displaystyle Fi 1 over warfi Warfi -1 0.61803,39887'ldots . In addition, Φ displaystyle Phi can be expressed as Φ and φ 1 1 1.61803 39887 ... 1 0.61803 39887 .... Display style Fi Warfi -1 1.61803,39887'ldots -1'0.61803',39887'ldots. that 1 φ and φ - 1 , display style 1 over warfi warfi -1, or its reverse: 1 Φ and Φ No 1. Displaystyle No.1 over Fi Fi.1. This means 0.61803...:1 and 1:1.61803.... Alternative forms of approximation to the mutual gold ratio by the end continuation of the factions, or the fibonacci number odds Formula φ 1 1/φ φ can be re-extended to get the continuation of the faction for the gold ratio: ⋱. display1;1.1,1, points 1cfrac {1} 1 cfrac {1} 1 cfrac {1} 1ddot and its mutual: φ 1 = [0 ; 1 , 1 , 1 , ...] = 0 + 1 1 + 1 1 + 1 1 + ⋱. {\displaystyle \varphi ^{-1}=[0;1,1,1,\dots]=0+{\cfrac {1}{1+{\cfrac {1}{1+{\cfrac {1}{1+\ddots }}}}}} The convergents of these continued fractions (1/1, 2/1, 3/2, 5/3, 8/5, 13/8, ..., or 1/1, 1/2, 2/3, 3/5, 5/8, 8/13, ...) are ratios of successive Fibonacci numbers. The φ2 1 and φ equation also produces an ongoing square root: φ 1 and 1 and 1 and 1 ⋯. Display-style warfi (warfi) sqrt 1sqrt (1 sq km) Infinite series ∞ ∑ φ can be obtained to express φ: 4 2n and 3 ! (n No 2) ! . Display style warfi frak {13}{8} sum n0infty frak (-1)n1 (2n'1)! (4'2n'3'n! (n'2)! Also: φ Nos. 1 and 2 Sin (π / 10) 1 x 2 sin 18 ∘ display varphi 1 2 Sin (Pi /10) Sin 18 φ 1 2 csc (π / 10 ∘) KSC (Pi /10) 1 (more 2'csc 18'circ) φ 2 cos (π / 5) - 2 cos 36 ∘ Style 2'cos (Pee /5) 2'cos 36'circ th φ 2 sins (3 π / 10) 2 sins 54 ∘ . Displaystyle warfi 2 sin (3'pi /10)2 'sin 54'circ. This corresponds to the fact that the diagonal length of the ordinary pentagon is φ times larger than its side, and a similar relationship in the pentagram. Geometry Approximate and true golden spirals. The green spiral is made from a quarter of a tangent circle to the interior of each square, while the red spiral is the Golden Spiral, a special type of logaritic spiral. The overlapping parts appear yellow. The length of the side of one square, divided by the length of the next smaller square, is the golden ratio. The number of φ often appears in geometry, especially in figures with pentagonal symmetry. The length of the diagonal of the usual pentagon is two φ its side. The verticals of the regular icosahedron are those of three mutually orthogonal gold rectangles. There is no known common algorithm for the uniform organization of a certain number of nodes on the sphere, nor for any of the several definitions of even distribution (see, for example, the Thomson problem). However, the useful approximation is the result of dividing the sphere into parallel strips of equal surface area and placing one node in each band in longitudes, separated by the golden section of the circle, i.e. 360 /φ ≅ 222.5. This method was used to organize 1500 Starshine-3 satellite participation student mirrors. Dividing the linear segment into the internal division of the line segment into an internal division according to the gold ratio of having a linear segment AB, build perpendicular to B.C. at point B, with B.C. half the length of AB. Draw AC hypotenusia. Draw an arc with center C and a radius of B.C. This arc crosses the hypotenuse ac generalized current at point D. Draw an arc with center A and radius of ad. This arc crosses the original line AB at S. Point S divides the original AB linear segment into as and SB linear segments with gold-length segments. Dividing the line segment into the outer division of the line segment by external division in accordance with the gold ratio Draw the linear segment as and build a point S segment of THE SC perpendicular to AS and with the same length as AS. Make a split line of the AS segment with M. Circular arc around M with an MC radius intersecting at point B of a straight line through points A and S (also known as AS extension). AS's relationship to the SB segment is the gold ratio. Examples of application can be seen in Pentagon articles with this side length, Decagon given the circumference and Decagon with a given lateral length. Both of the above are displayed different algorithms produce geometric designs that define the two aligned segments of the line, where the longer-to-shorter ratio is the gold ratio. Golden triangle, pentagon and pentagram Golden Triangle. The double-red-arch angle is 36 degrees, or π 5 display (frac)pi ({5}) radian. The Golden Triangle Golden Triangle can be described as the isoceles of the ABC triangle with a property that srags the C angle produces a new CXB triangle that is similar to the triangle to the original. If the BCX angle α, the XCA α due to biction, and CAB α because of similar triangles; ABC - 2 from the original symmetry isosceles, and BXC No. 2 by similarities. The corners in the triangle add up to 180, so 5,180, giving α 36. Thus, the corners of the golden triangle are thus 36 -72-72 . The corners of the remaining blunt isocel of the AXC triangle (sometimes called the golden gnome) are 36-36-108. Suppose XB is 1 long, and we call B.C. φ. Because of the isossels of the triangles XC-XA and BC-XC, so they also have a length φ of φ. But the ABC triangle is similar to the CXB triangle, so AC/BC/BX, AC/φ and φ/1, and so ac also φ2. So φ2 φ 1, confirming φ this is really a golden ratio. Similarly, the ratio of the larger AXC triangle to the smaller CXB is equal to φ, while the reverse ratio is φ 1. The Pentagon's normal pentagon-to-side ratio is the golden ratio, while crossing the diagonals of each other in a gold ratio. Odom's Design Let A and B are intermediate points of the EF and ED equilateral DEF triangle. Expand AB to meet def circle on C. A B B C A C A B - φ display (tfrac) ABz BC (Tfrak) APC ABZ George Odom gave a surprisingly simple design for φ involving an equilateral triangle: if the equilateral triangle is inscribed in the circle and the linear segment, joining the middle of the two sides, is made for the intersection of the circle in any of them two points, then these three points are in golden proportion. This result is a direct consequence of the intersecting chords of theorem and can be used to build a regular pentagon, a construction that has caught the attention of noted Canadian geometer H. S. M. Coxeter, who published it in Odom's title as a diagram in the American Mathematical Monthly accompanied by one word Here! The pentagram is painted to distinguish its linear segments of different lengths. Four lengths in gold ratio to each other. The gold ratio plays an important role in the geometry of the pentagrams. Each intersection edges sections of other edges in a gold ratio. In addition, the ratio of the length of the shorter segment to the segment, limited by two intersecting edges (the side of the pentagon in the center of the pentagram), φ, as the four-color illustration shows. The pentagram includes ten triangles of isoceles: five sharp and five blunt triangles of isoceles. In all of them, the longer side-to-φ ratio. The blunt triangles of isoceles are golden gnomes. Ptolemy's theorem The Golden Ratio in a conventional pentagon can be calculated using the Ptolemy theorem. The properties of the gold ratio of the conventional pentagon can be confirmed by applying the Ptolemy theorem to a four-sided formed by removing one of its vertices. If the long edge is four-sided and diagonal b, and short edges a, then ptolemy theorem gives b2 and a2 AB, which gives b a 1 and 5 2 . Display-style b over a 1 sqrt {5} (more than 2). Consider the scale of triangles with parties of lengths A, b and C in order of reduction. Determine the scale of the triangle as the smaller of the two a/b and b/c ratio φ φ φ φ s. If r q φ then the shorter two sides 1 and φ, but their amount is φ2, thus r qlt; φ. A similar calculation shows that the r'gt; φ-1. A triangle whose sides are in a ratio of 1 : √φ : φ is the right triangle (because 1 and φ and φ2), known as the Kepler triangle. Golden Triangle, diamond and diamond triacotontahedron One of the rhombic triacotontahedre in the diamond All faces of the rhombic triaconachedron are golden diamonds Golden rombus diamond, the diagonals of which are in gold ratio. The rhyming tricedus is a convex polytopo, which has a special property: all his faces are golden diamonds. In diamond The savage angle between any two adjacent diamonds is 144, which is twice the isocele of the corner of the golden triangle and four times its sharpest angle. The relationship to the Fibonacci sequence Of the Mathematics of the Golden Ratio and the Fibonacci sequence are closely related. Fibonacci sequence: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, ... The closed form expression for the Fibonacci sequence includes the gold ratio: F (n) - φ n (1 - φ) n 5 and φ n (φ . . . . . He was a - he said . . . . . Displaystyle Fai left (n-right)Warfi Yo-(1-Warfi) above sqrt {5} Warfi (-Warfi {5}) Fibonacci spiral, which approaches the golden spiral, using Fibonacci sequence square sizes up to 34. The spiral is drawn from the inner square 1×1 and continues outwards to consistently larger squares. Golden squares with T-branching Golden Square Fractal Gold Ratio is the limit of the ratio of → ∞ consecutive terms of the Fibonacci sequence (or any Fibonacci as φ sequence), as shown in Kepler: Display-style lim ----------F_-1F_. In other words, if the Fibonacci number is divided into its immediate predecessor in sequence, the ratio approaches φ; for example, 987/610 ≈ 1.6180327868852. These approximations are alternately lower and higher than φ, and converge with the φ as the number of Fibonacci increases, and: ∑ n No. 1 ∞ F n φ - F n q φ. Displaystyle n1 infty F_On warfi -F_ 1'1'varphi . More generally: lim n → ∞ f n - a f n - φ a, F_ displaystyle lim nn'F_ n'n'n'a, where the above ratio of consecutive terms of The Fibonacci sequence, is the case when a 1. Display style a1. In addition, the consistent powers of φ obedience to the relapse of Fibonacci: φ n No. 1 and φ n φ n No 1 . This identity allows any φ in φ to be linear. For example: 3 φ 3 - 5 φ 2 , 4 - 3 (φ 2 - φ) - 5 φ 2, 4 - 3 (φ - 1) φ - 5 (φ 1) - 4 and φ 2 ≈ 3,618. Displaystyle beginning is leveled 3 warfi ({3}-5warfi {2} 43 (Warfi {2} Warfi)-5'varphi ({2} 4'3 (Warfi No.1) Warfi-5 (Warfi 1)4 Warfi 2'3.618. Reducing to linear expression can be achieved in one step by relationship φ k q f k φ f k 1 , display style varphi K F_ kvar F_k-1 where F k displaystyle F_ k is the number kth Fibonacci. this is not a special feature of φ, because polynomials in any solution x to square equation can be reduced in a similar way by applying: x 2 x b 'displaystyle x'{2}'ax'b' for data a, b in a way that X satisfies the equation. Even Even as a rule, any rational function (with rational ratios) of the root of the non-orthodox n-degree over the rationales can be reduced to a polynomial degree n'u2012 1. Formulated in terms of field theory, if α is the root of the non-binding n-degree polynomial, then (α) displaystyle mathbb (Alpha) has a degree n over displaystyle mathbb, with the base No. 1, α, α, α n 1 . . Displaystyle No.1, Alpha, Dots, Alpha n-1. The symmetry of the Golden Ratio and the reverse gold ratio φ ± (1 ± 5) / 2 display style warfi pm pm (1'pm sqrt {5})/2 have a set of symmetries that retain and interconnected them. They are both preserved by fractional linear transformations x, 1 / (1 x) , (x 1) / x, display x,1/(1-x), (x-1)/x, - this fact corresponds to the identity and definition of the square equation. In addition, they are interchangeable with three cards 1 x, 1 x, x / (x 1) display 1/x,1-x,x/(x-1) - they are reciprocal, symmetrical about 1/2 display 1/2 and (projectally) symmetrical about 2. More deeply, these maps form a subgroup of the modular group PSL (2 ,) display operator name PSL (2, matebff)) isomorphic for a symmetrical group of 3 letters, S 3, displaystyle S_{3}, matching set stabilizer No. 0, 1, ∞, S, , S_{2} S_{3} → S 3 (display C_{3}'lt;S_{3}) consisting of 3-cycles and identity ( ) (01 ∞) (0 ∞ 1) display (0'infty) (0'infty 1) captures two numbers, while 2 cycles change them, thus implementing the map. Other properties the Golden Ratio has the simplest expression (and slow convergence) as a continuing expansion of the proportion of any irrational number (see Alternative Forms above). This is, for this reason, one of the worst cases of lagrange's approaching theorem, and it is an extreme case of Hurwitz's inequality for approximatine. Perhaps this is why angles close to the gold ratio are often shown in phyllotaxis (plant growth). Defining square pauline and conjugation relationships lead to decimal values that have their fractional part in common with φ: φ 2 and φ 1 and 2.618 ... Warfi style display {2} Warfi 1 2.618 1 φ th φ 1st 0.618 .... . Displaystyle No.1 over Warfi Warfi -10.618 points.φ more generally, any power φ equals the sum of the two immediate powers: φ n no φ n - 1 - φ n - 2 - φ · F n and F n . Displaystyle Warfi Yune Warfi n-1 Warfi (n-2) warfi cdot operator name F (n-1). As a result, it is easy to decompose any force φ into a multiple φ and constant. Multiple and permanent are always near The Fibonacci room. This leads to another property of positive forces φ: If ⌊ n / 2 - 1 ⌋ y display style n/2-1'rfloor , then: φ n y φ n φ 1 y φ n φ ⋯ 3 2 - 2 m (display style) Warfi y varfi n-1varphi n-3 cdots (Warfi y n- φ 1-2m'varphi n-2-2m) φ φ n Displaystyle! Warfi-Warfi n-1varphi (n-2). When the gold ratio is used as the basis of a digit system (see Gold Base Ratio, sometimes referred to as phinary or φ-nary), each integer has a stop of submission despite φ be irrational, but each faction has a no-stop submission. The gold ratio is the fundamental unit of the algebraic field of the number (5) (display style)mathbb (sqrt {5}) and is the number Pisot-Vijayaraghavan. In the field (5) (display style) (Kvrt {5}) we have φ n L_ n F_'n'sqrt {5} more than 2, where L n displaystyle L_ n is the number n 'display n' -th Lucas. The golden ratio is also manifested in hyperbolic geometry, as the maximum distance from the point on one side of the ideal triangle to the closer to the other two sides: this distance, the lateral length of the equilateral triangle formed by the tangence points of the circle, inscribed in the ideal triangle, is 4 logs (φ). The golden ratio is also evident in the theory of modular functions. Let R (q) q q 1 /5 1 q 1 q 2 1 q 3 1 and ⋱. (R/q) cfrac q1/51cfrac (q'1'cfrac q'{2} 1 cfrac (q'{3}'1'ddots. Then R (e - 2 π) - φ 5 - φ, R (e - 2 π 5) - 5 1 (5 3 4 (φ - 1) 5 2 - 1) 1 5 and φ . Displaystyle R(e'-2'pi) (Swart) Warfi sqrt {5}-Warfi, Four R-2'pi sqrt {5}) quart {5}1 from left (5'frac {3}{4}) (Warfi -1) frak {5}{2}-1 right frac {1}{5} if a, b ∈ R - displaystyle a,b'in mathbb (R) and b - π 2 displaystyle ab'pi ({2} φ) , then φ (R (e - 2 a) φ) (R (e. . . . . He said , he said that I. He was a - he said that I . . . . . Displaystyle (R(e-2a)) Warfi) (R(e'-2b) Warfi shffi sqrt {5}. Decimal expansion of the Decimal Expansion of the Golden Ratio can be calculated directly from the expression of φ - 1 - 5 2 (Wampi) -1 sq. with {5} √5 ≈ 2.236067774998964 OEMIS: A002163. Square Root 5 can be calculated by The Babylonian method, starting with the initial estimate, such as xφ No 2 and itering x n No 1 (x n q 5/n) 2 display style x_ n1 frac n5/x_) {2} for n No 1, 2, 3, ... to the difference between and xn'1 becomes zero, up to the required number of numbers. The Babylonian algorithm for √5 is equivalent to Newton's method to solve the x2 and 5 and 0 equations. In its more general form, the Newton method can be applied directly to any algebraic, including the x2 and x 1 and 0 equations, determining the gold ratio. This gives an iteration that converges with the gold ratio of itself, x n No 1, x n 2 x 1 x 1, display x_ n1 frac x_ n{2} 12x_'n'-1, for an appropriate initial assessment of xφ such as xφ No. 1. A slightly faster method is to rewrite the equation as x 1 x x x 0, in which case Newton's iteration becomes x n No 1 x n 2 x 2 x x n 2. x_'1frac (x_ n'{2} 2x_'n'x_'n'n'{2}.) All these iterations converge fourfold; that is, each step roughly doubles the number of correct numbers. Thus, the gold ratio is relatively easy to calculate with arbitrary accuracy. The time it takes to calculate n digits of the gold ratio is proportional to the time it takes to separate two n-digit numbers. This is significantly faster than the known transcendental numbers algorithms, π and e. An easily programmed alternative, using only integer arithmetic, is to calculate two large successive numbers of Fibonacci and divide them. The ratio of the numbers Fibonacci F 25001 and F 25000, each of which is more than 5000 figures, gives more than 10,000 significant digits of the gold ratio. The decimal expansion of the φ gold ratio was calculated with an accuracy of two trillion (2×1012 and 2,000,000,000,000,000,000) figures. Pyramid Additional information: Mathematics and art Ordinary square pyramid is determined by its medial right triangle, the edges of which are the apotem pyramid (a), semi-base (b) and height (h); The angle of the face is also marked. Mathematical proportions b:h:a 1 : φ: φ display 1: sqrt warfi and Warfi and 3 : 4 : 5 display 3:4 1 5 and 1 : 4 / π : 1.61899 display 1:4/ :1.61899 is of particular interest in relation to the Egyptian pyramids. Both Egyptian pyramids and ordinary square pyramids resembling them can be analyzed in relation to the gold ratio and other ratios. Mathematical pyramids of the pyramid, in which apotem (sloping height along the bisator of the face) is equal to φ times semi-finished (half the width of the base) is sometimes called a golden pyramid. The triangle of isosels, which is the face of such a pyramid, can be built of two halves diagonally divided golden rectangle (the size of a semi-base by apothema), connecting the edges of medium length to make an apotem. The height of this pyramid φ display s'srt varphi once semi-base (i.e., the tilt of the face is φ display sqrt warfi); The square height equals the area of the face, φ fold the square semi-base. Medial triangle of this golden pyramid (see chart), with sides 1 : φ : φ display 1: sqrt varphi: Warfi is interesting in itself, Demonstrating with the pythagorean theorem the relationship φ - φ 2 - 1 display (sqrt) (warrt) (swwarta) (Warfi) ({2}-1) or φ - 1st φ display style warfi triangle Kepler is the only right proportion of the triangle with a length of edge in geometric progression, Just like the triangle 3-4-5 is the only right proportion of the triangle with the length of the edge in arithmetic progression. An angle with a tangent φ display (sqrtvarphi) corresponds to the corner that the side of the pyramid makes in relation to the ground, 51.827... degrees (51 49' 38). Almost similar form of the pyramid, but with rational proportions, is described in the mathematical papyrus Rhind (the source of a significant part of modern knowledge of ancient Egyptian mathematics), based on the triangle 3:4:5; The tilt of the face corresponding to the corner with a tangent of 4/3 is up to two decimal places, 53.13 degrees (53 degrees and 8 minutes). Sloping height or apot 5/3 or 1.666... once semi-base. Rhind papyrus has another pyramid problem as well, again with a rational slope (expressed as run over growth). Egyptian mathematics does not include the concept of irrational numbers, and a rational reverse slope (run/rise multiplied by 7 times to convert into their usual palm units per qubit) was used in the construction of pyramids. Another mathematical pyramid with proportions almost identical to golden is a pyramid with a perimeter equal to 2 times higher height, or h:b 4:π. The angle of this triangle is 51,854 degrees (51'51'), which is very close to 51,827 degrees of the Kepler triangle. This pyramid relationship corresponds to a random φ ≈ 4/π display sqrt warfi approximately 4/ Pi . Egyptian pyramids are known, very close in proportion to these mathematical pyramids. The Egyptian Pyramid of the Great Pyramid of Giza One Egyptian pyramid that is close to the golden pyramid is the Great Pyramid of Giza (also known as the Pyramid of Cheops or Khufu). Its slope is 51 52' close to the golden pyramid tilt of 51 50 - and even closer to the π base of the pyramid tilt 51 51. However, it has been found that several other mathematical theories of the shape of the Great Pyramid, based on rational slopes, are both more accurate and more plausible explanations for the slope of 51 x52. In the mid-nineteenth century, Friedrich Ruber studied various Egyptian pyramids, including the pyramids of Habre, Menkaur and some of the groups of Giza, Sakkara and Abusir. He did not apply the golden ratio to the Great Pyramid of Giza, but instead agreed with John Sha Perring that his side-to-height ratio was 8:5. For everyone else he applied measurements associated with the Kepler triangle and claimed that all or half of the lengths were related to their height in the gold ratio. In 1859, pyramid scientist John Taylor misinterpreted Herodotus (c. 440 BC), indicating that the height of the Great Pyramid was equal to the area of one of its facial triangles. This led Taylor to argue that in the Great Pyramid, the golden ratio is represented by the ratio of face length (the height of the slope tilted at an angle θ to the ground) to half the length of the side of the square base (the equivalent of the seat of the corner θ). The two above lengths are about 186.4 meters (612 feet) and 115.2 meters (378 feet), respectively. The ratio of these lengths is a gold ratio, accurate to more digits than any of the original measurements. Similarly, Howard Weiss reported a high height of 148.2 meters (486 feet) and a semi base of 116.4 meters (382 feet), giving 1.6189 for a ratio of sloping height to half the base, again more accurate than the variability of the data. Eric Temple Bell, a mathematician and historian, argued in 1950 that Egyptian mathematics would not support the ability to calculate the sloping height of the pyramids, or the ratio to height, except for the pyramid 3:4:5, since the 3:4:5 triangle was the only right triangle known to the Egyptians, and they did not know the Pythagoras theorem, nor any way to talk about irrationality, π or φ . . . . . He said that I was not Michael Rice argues that the main authorities in the history of Egyptian architecture claimed that the Egyptians were well acquainted with the gold ratio and that this is part of the mathematics of the pyramids, referring to Hedon (1957). Historians of science have long debated whether Egyptians have such knowledge, claiming that its appearance in the Great Pyramid is the result of chance. Controversial observations Examples of controversial gold-rate observations include the following: Nautilus shells often mistakenly claim to have a golden proportion. Some specific proportions in the bodies of many animals (including humans) and parts of shell shells are often claimed to be in gold ratio. However, the actual performance of these elements varies considerably in individuals, and this proportion is often very different from the gold ratio. The ratio of successive phalanxes of chis and metacarpal bone is said to be approaching the gold ratio. The shell of nautilus, the construction of which takes place in a logarmic spiral, is often cited, usually with the idea that any logarithic spiral is associated with

solutions, one positive and one negative, to this equation. φ is defined as a positive decision. A negative solution can be written as a 1 x 5 2 display (frac) 1-sqrt {5} {2}. The sum of these two solutions is the same, and the product of these two solutions is negative. Euclid, Elements, Book II, Proposition 11; Book IV, Offers 10-11; Book VI, Proposition 30; Book XIII, Offers 1-6, 8-11, 16-18. ^ Ἄκρον καὶ μέσον λόγον εὐθεῖα τετμῆσθαι λέγεται, ὅταν ᾖ ὡς ἡ ὅλη πρὸς τὸ μεῖζον τμῆμα, οὕτως τὸ μεῖζον πρὸς τὸ ἔλαττὸν. - after the classical Greek sculptor Fidias (c. 490-430 BC); Barr later wrote that he believed it was unlikely that Fidias actually used the gold ratio. Not to be confused with the silver medium, also known as the silver ratio. Taylor translated Herodotus: This pyramid, four-sided, every face, on all sides 8 lashes, and the height is equal. He interpreted this creatively, and in 1860 John Herschel was the first of many authors to repeat his false claim. In 2000, Roger Hertz-Fishler traced the error to Taylor. Citations : b Compendium mathematical Mathematical refuge. 2020-03-01. Received 2020-08-10. b Weissstein, Eric W. Golden Ratio. mathworld.wolfram.com. received 2020-08-10. b c OEIS: A001622 - Livio 2003, page 3, 81. a b Dunlap, Richard A., Golden Ratio and Fibonacci Numbers, World Scientific Publishing, 1997 - Euclid, Elements, Book 6, Definition 3. a b Fink, Carl; Beman, Worcester Woodruff; Smith, David Eugene (1903). A Brief History of Mathematics: An Authorised Translation by Geshite der Elementar Mathematician by Dr. Carl Fink. Chicago: Open Court Publishing Co. 223. Sammerson John, Heavenly Mansions: And Other Essays on Architecture (New York: W.W. Norton, 1963) p. 37. The same applies to architecture, to a rectangle representing these and other ratios (e.g. the golden cut). - Jay Hambidge, Dynamic Symmetry: Greek Vase, New Haven CT: Yale University Press University, 1920 - William Lidwell, Critina Holden, Jill Butler, Universal Design Principles: Interdisciplinary Handbook, Gloucester MA: Rockport Publishers, 2003 De divina proportione, Luca Paganin de Paganinus de Brecia (Antonio Capella) 1509, Venice. Strogats, Stephen (September 24, 2012). : proportion control. The New York Times. a b Weisstein, Eric W. Golden Coefficient Conjugat. Matmir. Livio 2003, page 6. Livio 2003, page 4: ... the line of separation that Euclid identified for ... Purely geometric goals ... - Livio 2003, page 7-8. Livio 2003, page 4-5. Livio 2003, page 78. - Hemenway, Priya (2005). Divine proportion: Phi in art, nature and science. New York: Sterling. 20-21. ISBN 978-1-4027-3522-6. Livio 2003, page 3. Richard Fitzpatrick (translator) (2007). Elements of Euclid's geometry. page 156. ISBN 978-0615179841. Livio 2003, page 88-96. Livio 2003, page 131-132. Baravalle, H.V. (1948). Geometry is a pentagon and a gold section. A math teacher. 41: 22–31. Livio 2003, page 141. Schreiber, Peter (1995). Addition to the document by J. Shalit Origins analysis of the Euclidean algorithm. History Mathematics. 22 (4): 422–424. doi:10.1006/hmat.1995.1033. Livio 2003, page 151-152. The golden ratio. MacTutor Mathematics History Archive. Received 2007-09-18. Weisstein, Eric W. Formula Room Fibonacci Binet. Matmir. - Hertz-Fishler, Roger (1987). A mathematical history of separation in extreme and medium ratio. Wilfrid Laurier University Press. ISBN 978-0889201521. Substitute, Alfred S.; Lehmann, Ingmar (2011). Glorious Golden Ratio. Prometheus Books. page 8. ISBN 9-781-61614-424-1. Substitute, Alfred S.; Lehmann, Ingmar (2011). Glorious Golden Ratio. Prometheus Books. page 285. ISBN 9-781-61614-424-1. Theodore Andrea Thea cook The curves of life. London: Constable and Company Ltd. 420. Mark Barr (1929). Beauty options. Architecture (NY). It's Tom. 60. page 325. Reprinted: Beauty Options. I think. Vol. 10-11. International Business Machines Corporation. 1944. - Livio 2003, page 5. Weisstein, Eric W. Golden Ratio. Matmir. Martin Gardner (2001). Colossal book of mathematics: classic puzzles, paradoxes and problems. W. W. Norton and company. 77, 88. ISBN 9780393020236. Andrea Gerlin (October 5, 2011). Schechtman Technion won the Nobel Prize in Chemistry for the discovery of quasi-crystal. Bloomberg. Archive from the original dated December 5, 2014. Received on January 4, 2019. Yarik, Marco W. (2012), Introduction to mathematics quasi-crystals, Elsevier, p. x, ISBN 9780323159470, Although at the time of the discovery of quasi-crystals the theory of quasi-period functions was known for almost sixty years, it was the mathematics of the aperionic foam tiles, mainly developed by Nikolaas de Bruine, had a great impact on the new area. Livio 2003, page 203-209. Goldman, Alan E.; et al. (1996). Quasi-crystal materials. An American scientist. 84 (3): 230–241. a b Boussora, Kenza and Mazouz, Said, The Use of the Golden Section in the Great Mosque of Kairouan, Nexus Network Journal, vol. 6 No 1 (spring 2004). Elliot, Jason (2006). Mirrors Invisible: Travel to Iran. Mcmillan. page 277, 284. ISBN 978-0-312-30191-0. Le Corbusier, Modulor page 25, as cited in Padovan, Richard, Proportion: Science, Philosophy, Architecture (1999), page 316, Taylor and Francis, ISBN 0-419-22780-6 - Frings, Marcus, Gold section in architectural theory, Nexus Journal Network vol. 4 No 1 (Winter 2002). Le Corbusier, Moduler, page 35, as mentioned in Padovan, Richard, Proportion: Science, Philosophy, Architecture (1999), page 320. Taylor and Frances. ISBN 0-419-22780-6: Both paintings and architectural projects use the golden part. Urwin, Simon. Architecture Analysis (2003) page 154-155, ISBN 0-415-30685-X and Livio 2003, page 134-135. George W. Hart (1999). Leonardo da Vinci's polygedra. Hart, George. Received on March 10, 2019. b c d Livio, Mario (November 1, 2002). Golden ratio and aesthetics. Plus a magazine. Received on November 26, 2018. Keith Devlin (May 2007). A myth that won't go away. Received on September 26, 2013. Part of the process of becoming a mathematical writer seems to be learning that you can't refer to the golden ratio without following the first mention of a phrase that goes something like that the ancient Greeks and others believed to be divine and mystical properties. Almost like a compulsive desire to add a second factoid by Leonardo da Vinci believes that the human form reflects the golden ratio. There is no shred to back back up either claim and have every reason to believe that they are both false. However, both claims, along with various others in a similar vein, live. Donald E. Seamanek. Fibonacci Flim-Flam. Archive from the original january 9, 2010. Received on April 9, 2013. Salvador Dali (2008). Dali Dimension: Decoding the Mind of a Genius (DVD). Media 3.14-TVC-FGSD-IRL-AVRO. Hunt, Carla Herndon and Gilkey, Susan Nicodemus. Teaching mathematics in the block of page. 44, 47, ISBN 1-883001-51-X - Olariu, Agatha, Golden Section and Art painting Available online - Tosto, Pablo, La Composition en las artes pl'sticas - el n mero de Ora, Libreh Hashet, 1969, page 134-144 January Tschhold. Book Form, page 43 Figure 4. The frames of ideal proportions in a medieval manuscript without several columns. Determined by Jan Tschichold 1953. Page proportion 2:3. 1:1:2:3, Text area proportion in the Golden Section. The lower outer corner of the text area is also fixed diagonally. - Tschichold, Jan (1991). The shape of the book. Hartley and Marx (1991). 27-28. ISBN 0-88179-116-4. Ronald Jones (1971). The golden section: the most remarkable measure. Structuralist. 11: 44–52. Who can suspect, for example, that the switch plate for single switches is standardized from the point of view of the Golden Rectangle? Johnson, Art (1999). Famous problems and their mathematicians. Libraries are unlimited. page 45. ISBN 978-1-56308-446-1. The gold ratio is a standard feature of many modern designs, from postcards and credit cards to posters and light switches. Stahov and Olsen 2009, page 21. The credit card is shaped like a gold rectangle. - Cox, Simon (2004). Hacking the Da Vinci Code: An unauthorized guide to the facts of Dan Brown's bestseller. Barnes and the noble books. 62. ISBN 978-0-7607-5931-8. The gold ratio also crops up in some very unlikely places: widescreen TVs, postcards, credit cards and photos all usually correspond to its proportions. Lendvay, Erne (1971). Bela Bartok: Analysis of his music. London: Kahn and Averill. Livio 2003, page 190. Smith, Peter F. Dynamics of Delight: Architecture and Aesthetics (New York: Routledge, 2003) 83, ISBN 0-415-30010-X and Roy Hout (1983). Debussy in proportion: Musical analysis. Cambridge University Press. ISBN 978-0-521-31145-8. Simon Trezeze (1994). Debussy: Press Office of Cambridge University La Mer. page 53. ISBN 978-0-521-44656-3. Pearl Masters Premium. Pearl Corporation. Archive from the original on December 19, 2007. Received on December 2, 2007. Scale 833 cents: Harmony experiment, Huygens-Fokker.org. Access to December 1, 2012. Livio 2003, page 154. Richard Padovan (1999). Proportion. Taylor and Frances. 305-306. ISBN 978-0-419-22780-9. Padovan, Richard (2002). Proportion: Science, Architecture. Network magazine Nexus. 4 (1): 113–122. doi:10.1007/s00004-001-0008-7. Seising, Adolph (1854). Neue Lehre van den Promen de Meshlishen Curpers. Preface. The gold ratio found in the quantum world. Eurekalert.org. 2010-01-07. Received 2011-10-31. Pommersheim, James E., Tim K. Marks and Erica L. Flapan, eds. 2010. Number Theory: A lively introduction with evidence, apps and stories. John Wylie and Sons: 82. Weisstein, Eric W. (2002). The gold ratio is conjuged. A Brief Encyclopedia of Mathematics CRC, Second Edition, page 1207-8. CRC Press. ISBN 9781420035223. Max Hyperin; Barbara K. Kaiser; Carl W. Knight (1998). Specific abstractions: Introduction to computer science using diagram. Brooks / Cole Pub Co. ISBN 978-0-534-95211-2. Brian Rozelle, Golden Middle Series - Disco Ball in Space. Nasa. 2001-10-09. Received 2007-04-16. Chris and Penny. The quadaria and the requests. Mathematics Central. Received on October 23, 2011. American Mathematical Month, page 49-50, 1954. a b c d e Herz-Fischler, Roger (2000). The shape of the Great Pyramid. Wilfrid Laurier University Press. ISBN 978-0-88920-324-2. (page is needed) - Coca, Mehmet; Coca, Nazife Ozdes; Kosh, Ramadan (2010), Catalan solids derived from three-dimensional root systems and tanks, journal of mathematical physics, 51 (4): 043501, arXiv:0908.3272, Bibcode:2010JMP.... 51d3501K, doi:10.1063/1.3356985, S2CID 115157829. Tattersall, James Joseph (2005). The theory of elementary numbers in nine chapters (2nd place). Cambridge University Press. page 28. ISBN 978-0-521-85014-8. Fibonacci Rooms and Nature - Part 2 : Why is the Golden Section the best arrangement?, from Dr. Ron Knott's Fibonacci Rooms and the Golden Section, extracted 2012-11-29. Weisstein, Eric W. Pisot No. Matmir. - Horocycles exinscrits : une propri't hyperbolic remarquable, cabri.net, extracted 2009-07-21. Brandt, B. et al. Continuation of the Rogers-Ramanujan faction - Yee, Alexander J. (August 17, 2015). The golden ratio. numberword.org. Independent Computing by Ron Watkins and Dustin Kirkland. Alison, Jim (2006). Steve Nixon, Steve: 17 articles on science, history and philosophy. ISBN 978-1-4259-7040-6. a b Ghyka, Matila (1977). Geometry of art and life. New York: Dover. 22-24. ISBN 9780486235424. Midhat Ghazale, Gnomon: From Pharaohs to Fractals, Princeton Uni. Press, 1999 - b Eli Maor, trigonometry delights, Princeton univ. Press, 2000 - Hogben, Lancelot, Mathematics for a Million, London: Allen and Unwin, 1942, page 63., as cited by Terezi, Dick, Lost Discoveries: Ancient Roots of Modern Science - from Babylonians to Mayans, New York: Simon Schuster, 2003, p.56 - The Great Pyramid, The Great Discovery, and the Great Discovery. Archive from the original 2014-01-02. Received 2007-11-25. - Hertz-Fischler, Roger (2000). The shape of the Great Pyramid. Wilfrid Laurier University Press. 80-89. ISBN 978-0-88920-324-2. b Livio 2003, page 55-58. Taylor, Great Pyramid: Why was it built and who built it?, 1859 - Bell, Eric Temple (1940). The development of mathematics. New York: Dover. page 40. ISBN 9780486272399. Rice, Michael, Legacy of Egypt: Archetypes of Western Civilization, 3000 - 30 BC p. 24 Routledge, 2003, ISBN 0-415-26876-1 S. Giedon, 1957, Beginning of Architecture, AV Mellon Lecture in Fine Arts, 457, as cited in Rice, Michael, Legacy of Egypt: Archetypes of Western Civilization, 3000 B.C. 24 Routledge, 2003 - Markowski, George (January 1992). Misconceptions about the Golden Ratio (PDF). College Mathematics Magazine. Mathematical Association of America. 23 (1): 2–19. doi:10.2307/2686193. JSTOR 2686193. a b Pheasant, Stephen (1998). Body space. London: Taylor and Frances. ISBN 978-0-7484-0067-6. b van Laak, Walter (2001). The best story of our world: Volume 1 of the Universe. Aachen: van Laach GmbH. - Moscow, Ivan, Ivan Moshovich Mastermind Collection: Hanging Square - Other Puzzles, New York: Sterling, 2004 Sea Shell Spiral. Scientific news. Man, John, Gutenberg: How One Man Remade the World with the Word (2002) p. 166-167, Wylie, ISBN 0-471-21823-5. The half-page (30.7 × 44.5 cm) was made up of two rectangles - the entire page and its text area, based on the so-called golden section, which identifies an important link between short and long sides, and produces an irrational number like a pi, but a ratio of about 5:8. Worshule der Stetic. Leipzig: Breitkopf and Hurtel. 190-202. Livio 2003, page 7. For example, Osler writes that 38.2 percent and 61.8 percent of the pullbacks of recent ups or downs are common in Osler, Carol (2000). Resistance support: technical analysis and intraday exchange rates (PDF). Economic Policy Review of the Federal Reserve Bank of New York. 6 (2): 53–68. Roy Batchelor and Richard Ramjar, Magic Figures in the Dow, 25th International Symposium on Forecasting, 2005, page 13, 31. Not since the big beautiful days giants looked better, Tom Stevenson, The Daily Telegraph, April 10, 2006, and Technical Failure, The Economist, September 23, 2006, are popular press accounts of Batchelor and Ramyar Research. Livio 2003, page 74-75. Van Mersbergen, Audrey M., Rhetorical Prototypes in Architecture: Measuring the Acropolis with Philosophical Controversy, Communication quarterly, Volume 46 No. 2, 1998, p. 194-213. Keith J. Devlin (2009) Mathematical Instinct: Why You Are a Mathematical Genius (along with lobsters, birds, cats and dogs). New York: Major Books. page 54. Ghazale, Midhat J., Gnomon: From Pharaohs to Fractals, Princeton University Press, 1999, p. 125. ISBN 0-691-00514-1 - Patrice Futakis, Have the Greeks built according to the gold ratio?, Cambridge Archaeological Journal, vol. 24, n'1, February 2014, page 71-86. - Le Salon de la Section d'Or, October 1912, Pompidou Mediation Centre - Jeunes Peintres ne vous frappez pas!, La Section d'Or: Num're sp'scial consacres - l'Exposition de la Section d'Or, premiere anne, No. 1, 9 octobre 1912, p. 1-7, Kandinsky Library - Herbert, Robert, Neoimpressionism, New York: Solomon R. Guggenheim Foundation, 1968 Page needed a b Camfield, William A., Juan Grice and The Golden Section , Art Bulletin, 47, No 1, March 1965, 128-134. 68 - Green, Christopher, Juan Grice, Whitechapel Art Gallery, London, 18 September-29 November 1992; Staatsgalerie Stuttgart December 18, 1992-14 February 1993; Rijksmuseum Kruller-Mueller, Otterlo, 6 March-2 May 1993, Yale University Press Office, 1992, page 37-38, ISBN 0300053746, Cottington, David, Cubism and its history, Critical Perspectives of the Barber Institute in the Art History Series, Critical Perspectives in Art History, Manchester University Press, 2004, page 112, 142, ISBN 0719050049 - Roger Allard, Sur quelques peintre, Les Marches du Sud-Ouest, June 1911, p. 57-64. In Mark Antliff and Patricia Leighten, Cubism Reader, Documents and Criticism, 1906-1914, University of Chicago Press, 2008, page 178-191, 330. Bulo, Charles, Secret Geometry Artist: Exploring Composition in Art (1963) p. 247-248, Harcourt, Brace and The World, ISBN 0-87817-259-9 Works cited by Livio, Mario (2003) . Golden Ratio: The Story of Phi, the most surprising number in the world (First paperback trade ed.). New York: Broadway Books. ISBN 978-0-7679-0816-0.CS1 maint: ref'harv (link) Stakhov, Alexey P.; Scott Olsen (2009). Mathematics of harmony: from Euclid to modern mathematics and computer science. Singapore: World Scientific Publishing. ISBN 978-981-277-582-5.CS1 maint: ref'harv (link) Further reading Doczi, Gyorgy (2005) (1981). The power of limits: Proportional harmony in nature, art and architecture. Boston: Shambhala Publications. ISBN 978-1-59030-259-0. Hemenway, Priya (2005). Divine proportion: Phi in art, nature and science. New York: Sterling. ISBN 978-1-4027-3522-6. Huntley, H. E. (1970). Divine proportion: a study of mathematical beauty. New York: Dover Publications. ISBN 978-0-486-22254-7. Joseph, George G. (2000) (1991). Peacock Cross: Non-European Roots of Mathematics (New Ed.). Princeton, N.J.: Princeton University Press. ISBN 978-0-691-00659-8. Salquist, Leif (2008). Cardinal Alignments and The Golden Section: Principles of Ancient Cosmography and Design (3rd Reverend Charleston BookSurge. ISBN 978-1-4196-2157-4. Michael S. Schneider (1994). A beginner's guide to building the universe: mathematical archetypes of nature, art and science. New York: HarperCollins. ISBN 978-0-06-016939-8. Scimone, Aldo (1997). La Cesione Aurea. Storia culturale di un leitmotiv della Matematica. Palermo: Sigma Edizioni. ISBN 978-88-7231-025-0. Walser, Hans (2001) (Der Goldene Schnitt 1993). The golden section. Peter Hilton is trans. Washington, D.C.: Mathematical Association of America. ISBN 978-0-88385-534-8. External Commons references have media related to the gold ratio. Golden Ratio, Encyclopedia of Mathematics, EMS Press, 2001 (1994) Golden Section by Michael Schreiber, Wolfram Demonstrations Project, 2007. Golden section in pictures: Golden Ratio, Golden Triangles, Weisstein's Golden Spiral, Eric W. Golden Section. Matmir. The quotations about the Golden Ratio Explorer explains the mystery of the gold ratio. FizOrg. December 21, 2009. Knott, Ron. Gold section ratio: Phi. Information and activities of a professor of mathematics. Pentagram and Golden Ratio. Green, Thomas M. Updated June 2005. Archive November 2007. Instructions on geometry with problems to solve. Schneider, Robert. (2011). Golden pair of identities in number theory. arXiv:1109.3216 (mathematics. X. X. Proves formulas that include the middle ground and functions of Euler totient and Moebius. Received from 2Natural issue This article is about the issue. Not to be confused with Ʒ (ezh), ȝ (yogh), or ze (ze). Natural number ← 2 3 4 → -1 0 1 2 3 4 5 6 7 8 9 → List of numbers — Integers ← 0 10 20 30 40 50 60 70 80 90 →CardinalthreeOrdinal3rd(third)Numeral systemternaryFactorizationprimePrime2ndDivisors1, 3Greek numeralΓ´Roman numeralIII, iiiGreek prefixtri-Latin prefixtre-/ter-Binary112Ternary103Octal38Duodecimal312Hexadecimal316Arabic, Kurdish, Persian, Sindhi, Urdu۳Bengali, Assamese৩Chinese三,弍,叁Devanāgarī३Ge'ez፫Greekγ (or Γ)Hebrewג‎Japanese三/参Khmer៣Malayalam൩Tamil௩Telugu౩Kannada೩Thai๓N'ko߃Lao๓ 3 (three) is a number, numeral, and glyph. This is a natural number after 2 and the preceding 4, and is the smallest odd prime number. It has religious or cultural significance in many societies. The evolution of glyph Using three lines to indicate the number 3 occurred in many writing systems, including some (such as Roman and Chinese numerals) that are still in use. In particular, there was also an initial representation of three in the numerical notation of brahmin Indians. However, during the Gupta Empire the sign was changed by adding a curve on each line. Nagari rotated the lines clockwise, finishing each line with a short downward blow to the right. In the manuscript, the three-stroke script was eventually associated with a form of glyph resembling a 3 with an extra touch at the bottom as ȝ. Hindu figures extended to the caliphate in the 9th century. The lower passage was dropped around the 10th century in western parts of the caliphate, such as the Maghreb and Al-Andalus, when a separate version of the Western Arabic symbols of numbers, including the modern Western 3, was developed. In contrast, the Eastern Arabs have preserved and expanded this blow, rotating the character once again to cede the modern (eastern) Arabic figure ۳. In most modern Western fonts glyph 3, like other decimal numbers, has a capital high and is on the baseline. In fonts with text shapes, on the other hand, glyph usually has the height of the bottom letter x and descending: ɜ. In some French text fonts, however, it has an ascending instead of a descent. (quote needed) Flat 3 The general version of the number three has a flat top similar to the Ʒ symbol (ezh). This form is sometimes used to prevent a change of three to eight with fraudulent intent. It is on UPC-A barcodes and standard 52-card decks. (quote is necessary) Mathematics 3: a rough approximation of π (3.1415...) and a very rough approximation of e (2.71828..) when performing rapid assessments. number of non-collararic points needed to determine the plane and circle. the first strange prime number and the second smallest prime minister. first Farmat Prime (22n and 1). first Mercenn Prime (2n and 1). second Sophie Jermaine Premier. Mersenne's second prime exhibitor. Second Factor Prime (2! No 1). second Lucas Premier. second triangular number. It's the only simple triangular number. Fibonacci's fourth number. the smallest number of sides that a simple (not intersecting) landfill can have. Three is the only prime, which is one less than a perfect square. Any other number that is n2 No 1 for some integer n is not prime, as it is (n No 1) (n No 1). This is true for 3 as well (n No. 2), but in this case the smaller ratio is 1. If n is more than 2, both n No.1 and n No.1 are more than 1, so their product is not simple. The natural number is divided into three if the amount of its numbers in the base 10 is divided into 3. For example, the number 21 is divided into three (3 times 7), and the sum of its numbers is 2 and 1 and 3. Because of this, the reverse number, which is divided into three (or even any permutation of its numbers), is also divided into three. for example, 1368 and its reverse 8631 are both divided into three (and so 1386, 3168, 3186, 3618, etc.). Cm. also rule about possibility. This works in a base of 10 and in any positional digit system, the base of which is divided into three sheets the remainder of one (bases 4, 7, 10, etc.). Three of the five platonic solids have triangular faces - tetraedre, octahedre and icosahedr. In addition, three of the five platonic solids have a vertic, where three faces meet - tetraedr, hexaedr (cube) and dodekaedron. In addition, only three different types of landfills consist of the faces of five platonic solids - a triangle, a square and a pentagon. There are only three different 4×4 panmagic squares. According to the Pythagoras and Pythagoras school, number 3, which they called the triad, is the most noble of all digits, as it is the only number equal to the sum of all conditions below it, and the only number of which with those below is equal to the product of them and themselves. The corner trisection was one of the three known problems of antiquity. Gauss proved that each integrator is the sum of no more than 3 triangular numbers. The numerical system There is some evidence that the early person may have used a counting system that consisted of one, two, three, and then many to describe the limits of counting. Early nations had the word to describe the number of one, two and three, but any number outside it was simply labeled as Many. This is most likely based on the prevalence of this phenomenon among people in such disparate regions as the deep jungles of the Amazon and Borneo, where the explorers of Western civilization have historical records of their first encounters with these indigenous peoples. List of Baseline Calculations Multiply 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 2021 22 23 24 25 50 100 1000 10000 3 × x 3 6 9 12 1 5 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 6972 1 175 150 300 3000 3000 Division 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 3 ÷ x 3 1.5 1.75 0.6 0.5 0.428571 0.3 0.3 0.3 0.27 0.27 0.27 0.27 0.27 25 0.230769 0.2142857 0.2 0.1875 0.17647058823529411 0.16 0.1578947368421052 63 2630.15 x ÷ 3 0.3 0.6 1 1.3 1.6 2.3 2.6 3.3 3.6 4.3 4.6 5.3 5.6 5.6 5.6 3 3.6 4.3 4.6 5.3 5.6 5.6 5.6 5.6 3.6 6.3 6.6 Exhibitor 1 2 2 3 4 5 6 7 8 9 10 11 12 13 15 16 17 18 19 20 3x 3 9 27 81 243 729 2187 6561 19683 59049 177147 531441 1594323 47829699997 43046721 129140163 387420444 x3 1 8 8 27 64 125 216 343 512 729 1000 1331 1728 2197 2744 3375 4096 4913 5832 6859 8000 Science III stands for the giant star in the Yerx classification. Three is the atomic number of lithium. Third code ASCII End of text. First, it is the number of measurements that people can perceive. Humans perceive the universe as three spatial dimensions, but some theories, such as string theory, suggest that there are more. triangle, a polygon with three edges and three verticals, is the most stable physical form. For this reason, it is widely used in construction, design and design. The ability of the human eye to distinguish colors is based on the different sensitivity of different retinal cells to light of different wavelengths. Humans, being thhromatic, the retina contains three types of cells of color receptors, or cones. There are three main colors in additive and subtracting models. Protoscience In European alchemy, the three premieres (Latin: tria prima) were salt, sulfur () and mercury .). The three doshas (weaknesses) and their antidotes are the basis of Ayurvedic medicine in India. Pseudoscience Three is a symbolic representation for Moo, August Le Plongon and the lost continent of James Churchward. The main article of philosophy: Trichotomy (philosophy) Philosophers such as Aquinski, Kant, Hegel, K.S. Pierce and Carl Popper did three times the separation, or trichotomies, which were important in their work. Dialectics of hegel thesis and antithesis and synthesis creates a three-ness of two-ness. Religion See also: Triple deity Many world religions contain triple deities or concepts of the trinity, including: Hindu Trimurti Hindu Tridevi Three Jewels of Buddhism Three Pure of Taoism Christian Holy Trinity Triple Goddess Vikka Shield Trinity Trinity Chart of Christian Doctrine Trinity Christianity Three-Point Governance of Christ is a Christian doctrine. Jesus' ministry lasted about three years during the Agony in the Garden, and Christ requested that the bowl be taken from his lips three times. Jesus rose from the dead on the third day after his death. The devil tempted Jesus three times. St. Peter denied Jesus three times and three times confirmed his faith in Jesus the Magi- the wise men who were astronomers/astrologers from Persia - gave Jesus three gifts. There are three synoptic Gospels and three John's messages. The Apostle Paul went blind for three days after converting to Christianity. Noah's Judaism had three sons: Ham, Hem, and Jafet The Three Patriarchs: Abraham, Isaac, and Jacob the Prophet Valaam beat their donkey three times. The Prophet Jonah spent three days and nights in the belly of the great fish Three Divisions Written Torah: The Torah (Five Books of Moses), Neviem (Prophets), Ketuvima (Letters) Levite, Yisrael Three Daily Prayers: Shaharit, Mincha, Maariv Three Sabbath Food Sabbath ends when three stars are visible in the night sky Three Pilgrimage Festivals: Easter, Shavuot, Sukkot Tri Matzo on the Easter Seder table three weeks, a period of mourning overcoming the fast days of the Seventeenth Tammus Tisha B'Av Three Cardinal Sins, for which a Jew must die, not to transgress: idolatry, murder, sexual immorality, the first haircut of a Jewish boy at the age of 3 years, Beth Dean consists of three members potential converts traditionally turned away three times to test their sincerity in the Jewish mystical tradition of Kabbalah, it is believed that the soul consists of three parts, with the highest being neshamah (breath), the middle of the ruach (breath) Two elements are sometimes mentioned: Chaya (life or animal) and Ehid (unit). In Kabbalah, the Tree of Life (Hebrew: Etz ha-Hayim, עץ החיים) refers to the last three-post schematic representation of its central mystical symbol known as 10 Sephiro. Buddhism Triple Bodhi (ways to understand the end of birth) are Budhu, Pasebudhu, and Mahaarahat. Three jewels, three things that Buddhists hide in. Shinto Imperial Regalia of Japan sword, mirrors and jewels. Taoism Three Treasures (Chinese: 三寶; pinyin: sānbǎo; Wade-Giles: San Pao), the basic virtues of Taoism. Three Dantians Three Lines of Trigram Three Sovereigns: Heaven Fu Xi (Hand - Head - 3o Eyes), Humanity Shen Nong (Unit 69), Ad Nawa (Foot - Abdomen - Umbiculus). Hinduism of Trimurti: Brahma The Creator, Vishnu Reserve and Shiva Destroyer. The three Goons found a school of Hindu philosophy in Samhya. The three paths to salvation in Bhagavad Gita were called Karma Yoga, Bhakti Yoga and Jnan Yoga. The Three Virtues of Humata, Khukhta and Huvarsht (Good Thoughts, Good Words and Good Deeds) are the basic tenets of zoroastrianism. Scandinavian mythology Three is a very significant number in Norse mythology, along with its powers 9 and 27. Before Ragnarek, there will be three difficult winters without the intervention of the summer, Fimbulwinter. One survived three hardships on the World Tree in search of wounds: hanged himself, wounded himself with a spear and suffered from hunger and thirst. Bohr had three sons: One, Vila and We. Other Viccan religions rule three. Triple Goddess: Virgo, Mother, Kron; three fates. The sons of Kronus are zeus, Poseidon and Aides. The Slavic god Triglaly has three heads. The esoteric tradition of the Feosophical Society has three terms of membership. Three centers of Gurdjieff and the law of three. Liber AL vel Legis, the central scripture of the Telema religion, consists of three chapters corresponding to the three divine narrators respectively: Nuit, Ahit and Ra-Hur-Huit. The triple majesty of Hermes Trismegist is an important theme in hermetism. As a lucky or unlucky number this section needs additional quotes to check. Please help improve this article by adding quotes in Sources. Non-sources of materials can be challenged and removed. (April 2009) (Learn how and when to delete this template message) Three (三, formal letter: 叁, pinyin s'n, Cantonese: saam1) is considered a good number in Chinese culture because it sounds like a word alive (生 pinyin shung, Canton: saang1), compared to four (四, pinyin: sa, Cantonese: sei1), which sounds like the word death (死 pinyin sǐ, Cantonese: sei1). Counting to three is common in situations where a group of people want to perform the action in sync: Now, at count three, all pull! Assuming that the counter is at a flat rate, the first two items are required to set the rate, and the number of three is projected on the basis of terms one and two before it. Three is likely to be used instead of some other number because it requires a minimum number of counts when setting a bet. There is another superstition that is unlucky to take the third light, that is to be the third person to light a cigarette from the same match or lighter. It is sometimes claimed that this superstition arose among soldiers in the trenches of World War I, when a sniper could see the first light, aim at the second and shoot at the third. The phrase Third time charm refers to the superstition that after two failures in any endeavor, a third attempt is likely to succeed. It is also sometimes seen in the opposite direction, as the third person (doing something presumably forbidden) comes across. Luck, especially bad luck, is often said to come to the top three. Sport in American and Canadian football, field goals worth three points. In association football: For the purposes of the league standings, since the mid-1990s almost all leagues awarded three points for the win. The team that wins three trophies in a season is said to have won the triple. The player, who scored three goals in the match, reportedly scored a hat-trick. In baseball: Batter strikes out on the third strike in any one batting appearance. Half of each team's inning ends after the defense has recorded three outs (unless the hosts have a hit in the ninth inning or any extra inning). In the score 3 denotes the first baseman. In basketball: Three points are awarded for a basket made from behind a designated arc on the floor. Position 3 is a small forward. In bowling, three-stroke bowling is consistently known as turkey. In cricket, a bowler who is credited with dismissing batsmen on three consecutive deliveries has achieved a hat-trick. In the Gaelic games (Gaelic football for men and women, throwing, and camouflage), three points are awarded per goal, scored when the ball passes under the crossbar and between the gates of the post. In Ice Hockey: Scoring three goals is called a hat-trick (usually not a hyphen in North America). The team will There are three forwards on the ice at any given time. In a professional fight, a pin is when one holds the opponent's shoulders against the mat to count three. In rugby: A successful penalty for a goal or a drop goal is worth three points. In the French version of the bonus points system, the team gets a bonus point in the league standings if it wins the match, scoring at least three more tries than its opponent. The starting crescendo prop wears the number 3 jersey. In rugby league: One of the two starting points wears Mike's number 3. (The exception to this rule is the Super League, which uses static squad measurements.) The troika is the deadline to win three championships in a row. Triathlon consists of three activities: swimming, cycling and running. In many sports a competitor or team is said to win the Triple Crown if they win three particularly prestigious competitions. In volleyball, once the ball is served, teams can touch the ball three times before being required to return the ball to the other side of the court, with the definition of a touch being slightly different between indoor and beach volleyball. Film A number of film versions of the novel by Alexander Dumas The Three Musketeers: (1921, 1933, 1948, 1973, 1992, 1993 and 2011). Three Amigos (1986), a comedy film starring Steve Martin, Chevy Chase, and Martin Short. Three Kings (1999), starring George Clooney, Mark Wahlberg, Ice Cube, and Spike Jonze. 3 Days to Kill (2014), starring Kevin Costner. Three billboards outside Ebbing, Missouri (2017), starring Frances McDormand, Woody Harrelson, Sam Rockwell. See also Mathematics Portal Cube (algebra) - (3 superscript) The third triad List of motorways has moderated 3 Links - Georges Ifrah, Universal History of Numbers: From backstory to the invention of a computer translation. David Bellos et al London: Harvill Press (1998): 393, Pic. 24.63 - Priya Hemenway (2005), Divine Proportion: Phi In Art, Nature and Science, Sterling Publishing Company Inc., page 53-54, ISBN 1-4027-3522-7- Gribbin, Mary; John R. Gribbin; Edney, Ralph; Holliday, Nicholas (2003). Big numbers. Cambridge: The Wizard. ISBN 1840464313. The most stable form is the triangle. Mathematics in the city. Received on February 23, 2015. Eric John Holnard. Alchemy. 1995. p.153 - Walter Friedlander. The golden wand of medicine: the history of the kadus symbol in medicine. 1992. p.76-77 - Church, James (1931). The Lost Continent of Moo - symbols, vignettes, tables and diagrams. Pleiades Library. Received 2016-03-15. HUG 31, ff. 017r-v, inc. CF AD CE and CF CV ad. Kodis Hugeniani Internet. doi:10.1163/2468-0303-cohu_31-015. Encyclopedia Britannica. Lexikon des gesamten Buchwesens Online (in German). doi:10.1163/9789004337862_lgbo_com_050367. T. E. T. (January 25, 1877). Encyclopedia Britannica. Nature. XV (378): Marcus, Rabbi Yosy (2015). Why do many things in Judaism be done three times?. Ask Moses. Received on March 16, 2015. Shabbat. Judaism 101. 2011. Received on March 16, 2015. Whale, Eliyahu (2015). Three Matzots. Chabad.org. received on March 16, 2015. Kaplan, Rabbi Arie (August 28, 2004). Judaism and martyrdom. Aish.com. received on March 16, 2015. The basics of Upsherin: the first haircut of a boy. Chabad.org, 2015. Received on March 16, 2015. The transformation process. Center for conversion to Judaism. Received on March 16, 2015. Kaplan, Arie. Soul. Aish. From the Handbook of Jewish Thought (Tom. 2, Maznaim Publishing. Reprinted with Permission.) September 4, 2004. Received on February 24, 2015. James G. Lochtefeld, Gouna, in the Illustrated Encyclopedia of Hinduism: A-M, Volume 1, Rosen Publishing, ISBN 978-0-8239-3179-8, p. 265 - See the Bad in the Oxford Dictionary of Phrases and Fables, 2006, through Encyclopedia.com. Wells, D. Penguin Dictionary of Curious and Interesting Numbers London: Penguin Group. (1987): 46-48 External Links Look Three in Wiktionary, a free dictionary. Wikimedia Commons has media related to 3 (number). The tricyclopedic book by Michael Ek Troika in Human Anatomy by Dr. John A. McNulty Grime, James. 3 everywhere. Room. Brady Haran. Archive from the original 2013-05-14. Received 2013-04-13. Number 3 Positive Integer 3 Premiere Curiosities: 3 Extracted from fibonacci sequence and golden ratio in nature. fibonacci sequence and golden ratio example. fibonacci sequence and golden ratio difference. fibonacci sequence and golden ratio quiz. fibonacci sequence and golden ratio essay. fibonacci sequence and golden ratio ppt. fibonacci sequence and golden ratio in art. fibonacci sequence and golden ratio in music

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