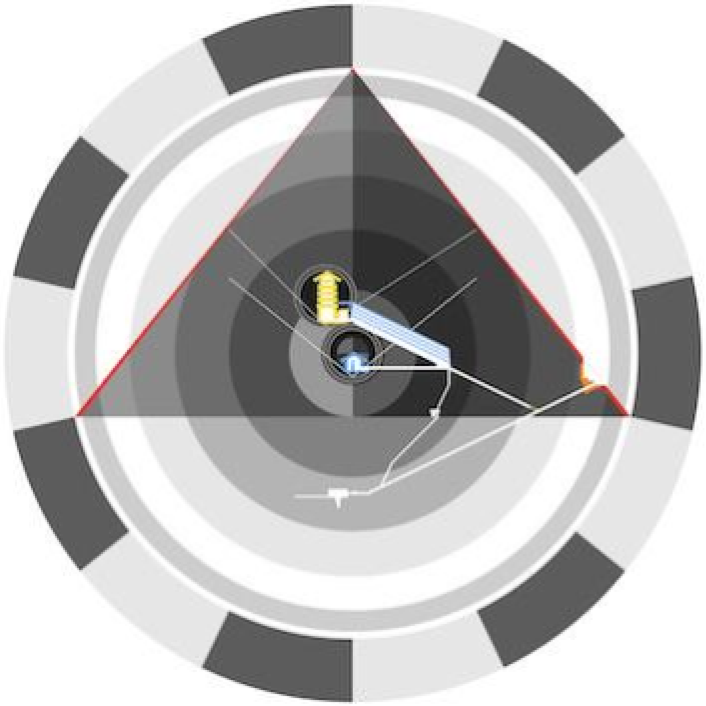


The Great Ratio™

Unlocking the Mathematical Secrets and Blueprint of the Great Pyramid

---

By Roberto A. Campusano
White Paper Version 1.0
Release Date: May 24, 2025

Dedication

This work is dedicated to **Normand J. Demers** —
a remarkable man of faith, compassion, and vision —
who, at the age of 19, sponsored my education in the United States.
His generosity changed the course of my life.

Father Demers was a true philanthropist who quietly supported the education of students from many countries. I was honored to be one of them.

In loving memory of
Father Normand J. Demers (1933–2018),
retired priest of the Diocese of Providence, Rhode Island,
graduate of Mt. St. Charles Academy,
and lifelong servant of community and knowledge.

May this work honor the spirit of his kindness.

Published in the month of May
in celebration of the birth of
Monserrat Rodríguez Martínez
on May 24th, 2025 —
a new light for a new generation.

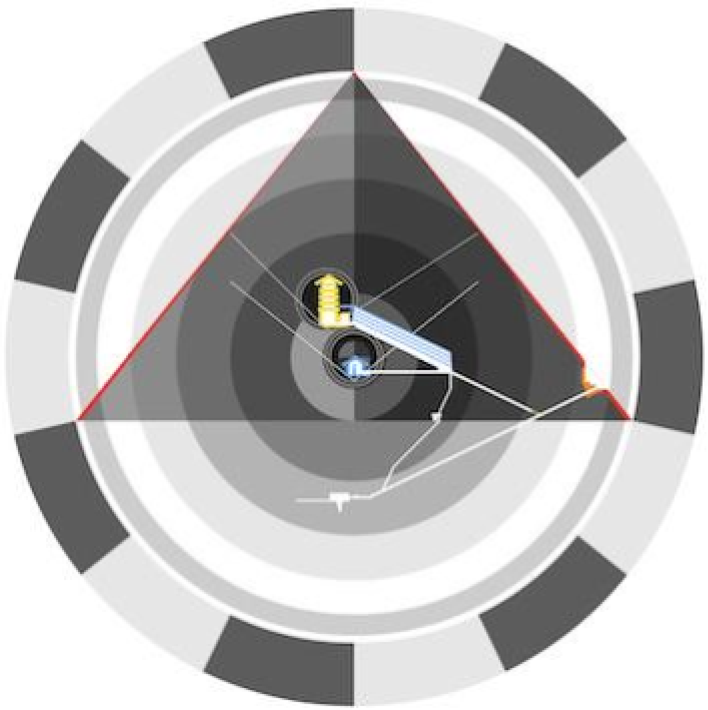
Table of Contents

Appendices

The Great Ratio

Unveiling "The Great Ratio":

Unlocking the Mathematical Secrets and Blueprint of the Great Pyramid



Abstract

In this white paper authored by Roberto Campusano, we embark on an in-depth journey to unravel the enigmatic secrets hidden within the Great Pyramid of Egypt, guided by the illuminating concept known as "The Great Ratio." Drawing inspiration from the iconic structure, this paper offers a comprehensive examination of the mathematical and architectural underpinnings of the pyramid,

shedding light on its meticulously crafted design, intricate proportions, and the ingenious application of fundamental mathematical constants.

"The Great Ratio" serves as the cornerstone of our investigation, enabling us to peer into the heart of the pyramid's construction.

Our research transcends mere analysis; it offers a portal to reverse engineer the original blueprint of the Great Pyramid, granting us the ability to recreate its architectural dimensions with unparalleled accuracy. Like revered mathematical constants such as pi (π) and the golden ratio (φ), "The Great Ratio" assumes its place as a universal constant, enshrined within the bounds of the unit circle. It symbolizes a resilient mathematical and architectural concept, encapsulating the intrinsic geometric harmony meticulously engineered into a pyramid designed to mirror the proportions of Egypt's most iconic structure.

As we delve into the depths of "The Great Ratio," this white paper elucidates how this concept transcends mere mathematics to become a foundational principle in the ongoing exploration and replication of the Great Pyramid's architectural and mathematical intricacies. Through meticulous analysis and scholarly examination, we aim to contribute to a deeper understanding of this ancient wonder and its enduring legacy in the realms of mathematics and architecture.

1. Introduction

In the shadow of Egypt's ancient wonder, the Great Pyramid, emerges a groundbreaking mathematical and architectural model—"The Great Ratio (Λ)." This innovative model has been meticulously crafted to unravel the mysteries and intricacies of the Great Pyramid's design, offering fresh perspectives into the mathematical harmony and architectural brilliance of this iconic structure.

At the heart of "The Great Ratio" lies a profound appreciation for the delicate interplay between two pivotal geometric elements of the pyramid:

- **The Radius of the Circle:** This dimension signifies the size of the circle that can be precisely inscribed at the very center of the pyramid. Within the context of "The Great Ratio," this radius assumes paramount significance, meticulously standardized to a specific value—120. To provide a universal reference, we also consider the unit circle, where the radius is a fixed 1 unit.
- **The Height of the Pyramid:** This fundamental measurement represents the vertical distance from the pyramid's base to its soaring apex, encapsulating the very essence of its grandeur.

"The Great Ratio" stands as a testament to the timeless relationship between these two core elements, emphasizing the critical ratio of the pyramid's height to the radius of the circle. This ratio serves as the cornerstone of our model, bestowing upon us invaluable insights into the geometric and mathematical essence inherent in the Great Pyramid's design and proportions.

But "The Great Ratio" is not merely a mathematical endeavor; it is a key to the reverse engineering of the original design of the Great Pyramid, providing a precise means to recreate its architectural dimensions and proportions. Through the meticulous application of this mathematical relationship, we embark on a journey to unlock the secrets of this ancient wonder.

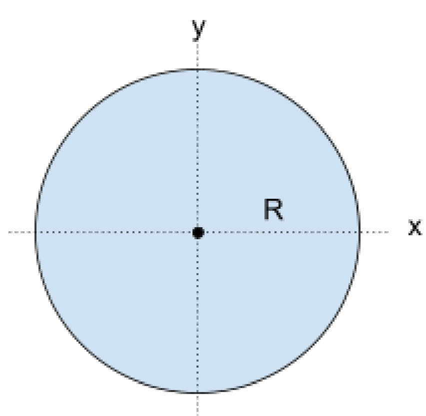
Λ = The Great Ratio
Λ (Lambda) - Lambda, often denoting proportionality and equilibrium, resonates harmoniously with the overarching theme of The Great Ratio.

2. The Unit Circle

Centered at the origin of the xy plane, defined by the point (0,0), the unit circle is a fundamental geometric concept characterized by its fixed radius of 1, as illustrated in the accompanying diagram. Its mathematical representation is as follows:

$$x^2 + y^2 = 1$$

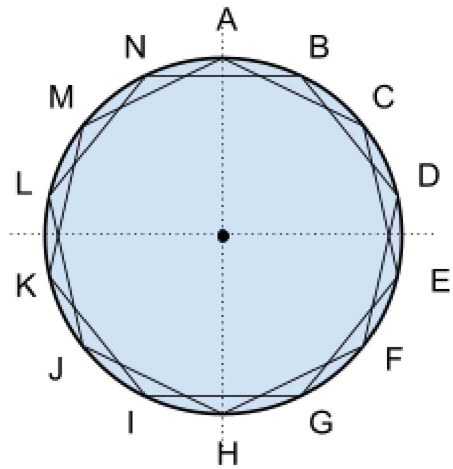
Before we dive into the intricacies of our calculations, it's essential to highlight the unit circle's intrinsic connection to the Great Pyramid. As we embark on this exploration, consider the unit circle as a crucial reference point that will help us navigate the fascinating depths of our investigation.



3. The Tetradecagon

In the realm of Euclidean geometry, the tetradecagon emerges as a lesser-known gem, comprising a total of 14 sides. While it may not boast the same fame as some of its geometric counterparts, its significance will steadily come to light as we delve deeper into our exploration, for it serves as the fundamental building block in the intricate design of the Great Pyramid. In the following section, we embark on a comprehensive journey through the intricate facets of this mysterious shape, unraveling its critical role within our architectural blueprints.

Conceptually, envision the tetradecagon as the fusion of two regular heptagons—each consisting of 7 sides—intertwined to form a singular entity: one heptagon points upward while the other points downward. This unique configuration forms the very foundation upon which we will build our understanding of the Great Pyramid's underlying geometry and proportions.



Angle Name	Degree	Sine	Cosine
$A = \pi/2$	90	1	0
$B = 5\pi/14$	64.2857142857	0.9009688679	0.4338837391
$C = 3\pi/14$	38.5714285714	0.6234898019	0.7818314825
$D = \pi/14$	12.8571428571	0.2225209340	0.9749279122
$E = 27\pi/14$	347.1428571429	-0.2225209340	0.9749279122
$F = 25\pi/14$	321.4285714286	-0.6234898019	0.7818314825
$G = 23\pi/14$	295.7142857143	-0.90096886794	0.4338837391
$H = 3\pi/2$	270	-1	0
$I = 19\pi/14$	244.2857142857	-0.9009688679	-0.4338837391
$J = 17\pi/14$	218.5714285714	-0.6234898019	-0.7818314825
$K = 15\pi/14$	192.8571428571	-0.2225209340	-0.9749279122
$L = 13\pi/14$	167.1428571429	0.2225209340	-0.9749279122
$M = 11\pi/14$	141.4285714286	0.6234898019	-0.7818314825
$N = 9\pi/14$	115.7142857143	0.90096886794	-0.4338837391

4. Calculating The Great Ratio (Λ)

The Great Ratio, a long-hidden geometric enigma responsible for shaping the design of the Great Pyramid of Giza, now emerges from the annals of history to take its place in contemporary mathematical discourse. Formally known as "The Great Ratio of the Great Pyramid," this section elucidates the meticulous process of uncovering and presenting this elusive mathematical gem to the broader audience, employing modern mathematical tools such as the unit circle and a Tetradecagon, a fourteen-sided polygon.

Definition and Computation:

Nestled within the confines of the unit circle, the Great Ratio manifests as the ratio between the height and the radius of a pyramid that mirrors the proportions of the Great Pyramid itself. Just as Pi and the Golden Ratio are universal constants of profound mathematical significance, the Great Ratio too holds its esteemed place within the pantheon of mathematical constants:

Great Ratio = Pyramid Height / Pyramid Radius

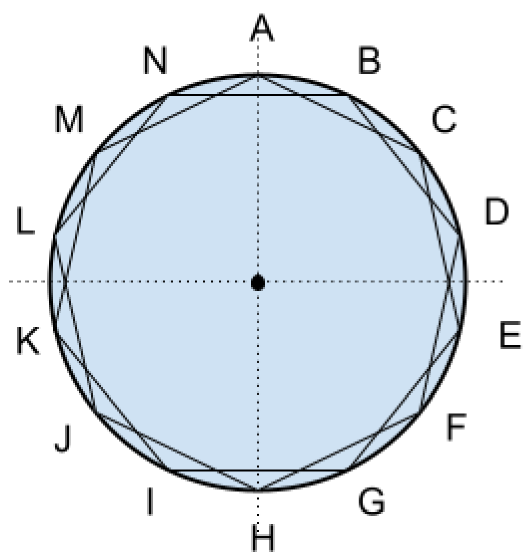
In the forthcoming exploration, we shall not only unveil the intricacies of this ancient enigma but also harness the Great Ratio to unlock the true measurements of the Great Pyramid, including its height, radius, and the precise location of its center.

$The\ great\ ratio\ = \Lambda\ = \frac{pyramid\ height}{pyramid\ radius}$

$\Lambda\ = 1\ +\ sin(\pi/14)$

$\Lambda\ \approx\ 1.2225209340$

Given:



$Figure\ 1\!:\ tetradecagon$

$the\ unit\ circle$

$radius\ =\ 1$

$angle\ at\ point\ A\ =\ \pi/2$

$angle\ at\ point\ D\ =\ \pi/14$

$angle\ at\ point\ E\ =\ 27\pi/14$

$27\pi/14\ =\ -\ \pi/14$

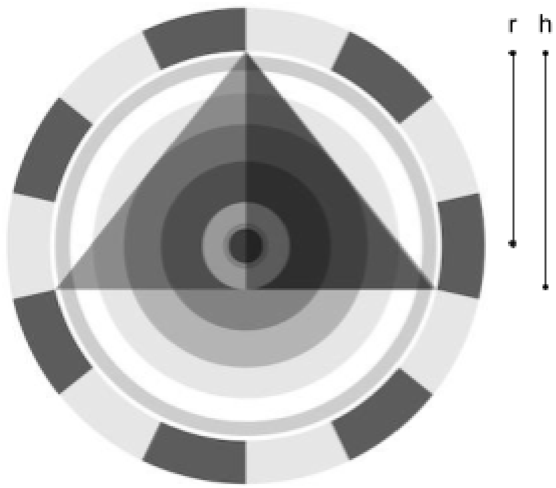
$\pi/14\ \approx\ 0.2243994753$

$27\pi/14 \approx 6.0587858319$

$sin(\pi/14) \approx 0.2225209340$

$sin(27\pi/14) \approx -\ 0.2225209340$

$sin(\pi/14) = |sin(27\pi/14)| = 0.2225209340$



Let:

$a = r = pyramid\ radius = 1$

$b = h - r = sin(\pi/14)$

$c = h = pyramid\ height$

$d = great\ ratio$

Then:

$c = a + b$

$c = pyramid\ radius + sin(\pi/14)$

$c = 1 + sin(\pi/14)$

$c \approx 1.2225209340$

$d = \frac{pyramid\ \ height}{pyramid\ radius}$

$d = c\ /\ a$

$d = \frac{1 + sin(\pi/14}{1}$

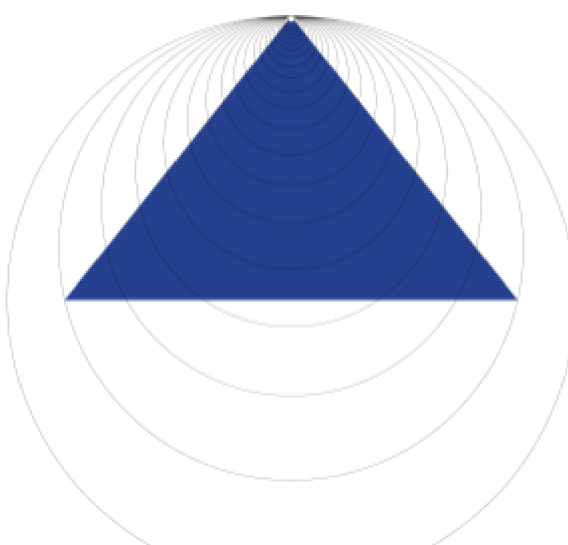
$d = 1 + sin(\pi/14)$

$The\ great\ ratio = 1 + sin(\pi/14)$

$The\ great\ ratio \approx 1.2225209340$

5. The Hidden Frequency:

Beneath the enigmatic aura of Egypt's timeless marvel, the Great Pyramid, unfolds a revolutionary mathematical and architectural concept—the "Hidden Frequency." This groundbreaking discovery delves deep into the intricate secrets and structural brilliance that shroud the Great Pyramid in an aura of wonder and mystery.



At the core of the "Hidden Frequency" lies a profound understanding of the harmonious relationship between two pivotal geometric elements within the pyramid:

1. Height of the Pyramid: This fundamental measurement captures the vertical span from the pyramid's base to its majestic apex, encapsulating the essence of its grandeur.
2. Radius of the Circle: This dimension represents the size of a circle that can be precisely inscribed at the pyramid's center. Within the realm of the "Hidden Frequency," this radius assumes paramount significance, meticulously standardized to a specific value—120. For a universal reference, we also consider the unit circle, where the radius is a fixed 1 unit.

The "Hidden Frequency" stands as a testament to the timeless interplay between these core elements, emphasizing the critical ratio of the pyramid's height to the radius of the circle. This ratio serves as the cornerstone of our exploration, unlocking invaluable insights into the geometric and mathematical essence that underlies the Great Pyramid's proportions.

However, the "Hidden Frequency" is not confined to mathematical exploration alone; it is the key to unveiling the original design of the Great Pyramid in reverse. It provides a precise means to recreate the architectural dimensions and proportions of this ancient marvel. Through the meticulous application of this mathematical relationship, we embark on a journey to decipher the enigma of this age-old wonder.

The Hidden Frequency:

The "Hidden Frequency" is not just a mathematical relationship for understanding the pyramid's dimensions; it is also a frequency that flows from the pinnacle of both the Great Pyramid and the Capstone downward, connecting with the Earth's essence. In this section, we will delve into this intriguing phenomenon and explore its far-reaching implications.

What is the Hidden Frequency?

The Hidden Frequency arises from a pattern that links the Radius and Height of a pyramid. This pattern can be extended both inward, into the pyramid, and outward, towards the Earth's core.

Exploring the Pattern Inward:

To trace this pattern inward, we designate the pyramid's radius as a new height and use this transformed height to calculate a fresh radius moving deeper into the pyramid, ascending towards its peak. We then employ this newfound radius as the next height and continue the pattern upwards within the pyramid, all while adhering to the principles of the Great Ratio.

Exploring the Pattern Outward:

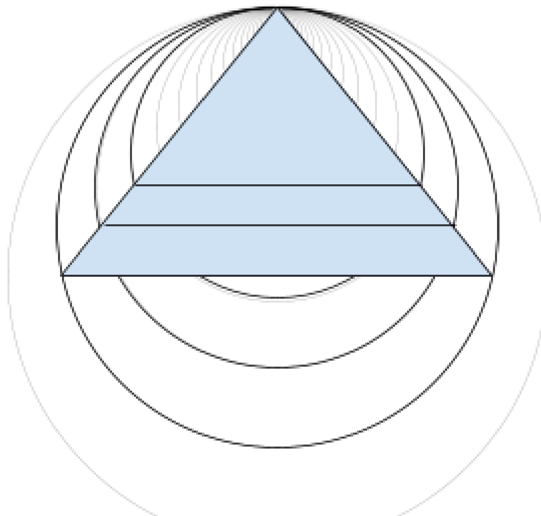
Conversely, to follow the pattern outward, towards the Earth's depths, we set the pyramid's height as the radius for the subsequent pattern. Using this new radius, we calculate a fresh height as we descend outside the pyramid, moving away from its base. We continually employ the newly discovered height as the next radius, perpetuating the pattern downward in alignment with the Great Ratio.

An intriguing observation arises: not only does the Great Pyramid produce this pattern, but the Capstone, as a separate pyramid entity, independently generates the same pattern. Additionally, a host of captivating phenomena and geometric behaviors accompanies these patterns, including the emergence of the Great Pyramid's Fractal.

The Pyramid’s Fractal:

The resulting pattern forms a fractal, as illustrated in the following figure. While challenging to fully depict here, the intricate concavities of the Great Pyramid, its

8-sided polyhedron origin, the depth of the subterranean chamber, and the position and alignment of the three pyramids all trace back to the pyramid's fractal structure.



Moreover, the Boss-Mark, a symbol found in the antechamber of the King's Chamber, also traces back to three different iterations of the pyramid's fractal.

6. The Pyramid Radius

Within the context of "The Great Ratio," we embark on a journey to uncover the elusive Pyramid Radius, a pivotal component in our quest to reverse engineer the Great Pyramid's original design. This Pyramid Radius, as revealed by "The Great Ratio," stands as a critical scientific tool, offering us a means to precisely ascertain this elusive dimension.

In the following section, we shall select one of the numerous proposed heights for the pyramid, a foundational parameter for our calculations. With this chosen height, we will employ geometric principles to determine the Pyramid Radius. This process is essential in our mission to restore the Great Pyramid's architectural dimensions to their authentic form.

Our initial height selection for exploration is set at 146.59 meters. To calculate the Pyramid Radius, we rely on the formula presented below:

Definition and Calculations:

The Pyramid Radius of any Great Pyramid at any scale can be calculated using the formula given here, below:

$$pyramid\ radius\ = \frac{pyramid\ height}{great\ ratio}$$

Given:

$$pyramid\ radius\ = \frac{pyramid\ height}{great\ ratio}$$

$$pyramid\ height\ = 146.59\ meters$$

$$great\ ratio = \Lambda = 1\ + sin(\pi/14)$$

Let:

$$a\ = 146.59\ meters$$

$$b\ = 1\ + sin(\pi/14)$$

Then:

$$pyramid\ radius\ = \frac{pyramid\ height}{great\ ratio}$$

$$pyramid\ radius\ = a/b$$

$$pyramid\ radius\ \approx 119.9079671590\ meters$$

However, an intriguing revelation comes to light: the Pyramid Radius, as initially calculated, appears to be irrational, which presents a captivating contrast to the rational unit radius of the unit circle. This incongruity naturally raises questions about the accuracy of this result.

It's important to note that the unit circle maintains a rational radius of 1. Consequently, it seems reasonable to expect that the Pyramid Radius should also be rational, with the Pyramid Height assumed to be irrational, mirroring the configuration of the unit circle.

To bring the Pyramid Radius in alignment with this rational ideal, we propose a revised value of 120 meters, in harmony with the meter as our chosen unit of measurement. This revelation carries profound implications, suggesting that the builders of the Great Pyramid possessed knowledge of the meter, challenging assertions of primitive origins for this remarkable architectural marvel.

It's worth mentioning that we might easily dismiss 119 as the correct answer due to its significant deviation from the ideal 119.90697. However, let's consider it nonetheless.

Now, let's delve into a fascinating comparison:

If we set the Pyramid Radius at 119 meters, we can express it as:

$119 = 7 \times 17$

Conversely, when we adjust the Pyramid Radius to 120 meters, we uncover an elegant expression that incorporates the initial numbers of the Fibonacci sequence and introduces the concept of the golden ratio:

$120 = 2^3 \times 3 \times 5$

Whether by design or happenstance, this presents a remarkable mathematical clue that strongly suggests the value of 120 over 119. Adding to this clue is the fact that 119.90697 rounds to 120.

The wealth of available data overwhelmingly supports the latter, confirming that 120 meters is the Missing Great Radius. This value is firmly established within the context of the meter as our unit of measurement.

Another interesting numerical alignment can be observed with the ratio **120 ÷ 100 = 1.2**. While not identical to the **Great Ratio** value of approximately **1.22252**, the proximity between these two values appears intentional rather than accidental. The use of simple, easily recognizable divisions such as 120 and 100 suggests an effort to approximate the Great Ratio within familiar numerical frameworks. This subtle correspondence offers further support for the existence and deliberate use of the Great Ratio, reinforcing its role as a guiding mathematical principle in ancient design.

In summary, we can confidently conclude that the Pyramid Radius, also referred to as the Great Radius, is indeed a rational number, specifically 120 meters. This revelation underscores the advanced mathematical knowledge possessed by the architects of the Great Pyramid.

The Missing Great Radius:

In the previous section, we concluded that The Pyramid Radius (also called: The Great Radius) was the rational number: 120 – that is, using the meter as the unit of measure.

The pyramid radius:

Great Pyramid	Meters	Feet
Radius	120	393.7007874016
Diameter	240	787.4015748031

7. The Meter & The Great Pyramid

Deep within the enigmatic realm of the Great Pyramid's design, a concealed mathematical message emerges, shedding light on a profound connection between this ancient marvel and the meter as our chosen unit of measurement. This cryptic message is none other than the Great Ratio, an integral concept giving rise to the Great Radius, and together they unlock hidden secrets within the Pyramid Polyhedron.

Embracing the meter as our fundamental unit of measure, we embark on a journey of discovery within the Great Pyramid's dimensions. Here, intriguing facts and patterns reveal themselves, reaffirming the mystical connection between the Great Ratio, the meter, and the pyramid's structure:

Firstly, the number 120, when expressed as (2^3) multiplied by 3 and 5, establishes a remarkable foundation for our exploration. Moreover, it can be ingeniously represented as the product of 3, 5, and 8, further emphasizing its significance within this mathematical narrative.

$$120 = 2^3 \times 3 \times 5$$

$120 = 3 \times 5 \times 8$

In the pursuit of precision, we delve deeper into the realm of prime numbers, uncovering the astonishing relationship between 120 and the Fibonacci sequence, whose enchanting progression reads as follows: 1, 2, 3, 5, 8...

$120 = 1 \times 2 \times 2 \times 2 \times 5 \times 3$

$great\ ratio \approx 1.2225209340$

Remarkably, the diameter of our unit circle, set at 240, intricately intertwines with the Great Ratio and the Fibonacci sequence, resonating with the sequence's initial values of 1, 2, 3, 5, and 8. It is as if the very fabric of the Great Pyramid's essence is woven into these numerical symphonies.

$120 = 1 \times 2^3 \times 3 \times 5$

$fibonacci\ = 1,\ 2,\ 3,\ 5,\ 8...$

Consider the diameter and compare it with the first 6 digits of the Great Ratio.

$diameter\ = 240 = 1 \times 2 \times 2 \times 2 \times 5 \times 2 \times 3$

$great\ ratio \approx 1.2225209340$

Intriguingly, the number 120 shares its first two digits with the Great Ratio, exemplifying their profound connection.

$Radius\ =\ 120$

$great\ ratio \approx 1.2225209340$

Additionally, it proudly contains the first four numbers of the Fibonacci sequence: 2, 3, 5, and 8. When dissected into its prime factors, 240 further reveals itself as a reflection of the first five digits of the Fibonacci sequence, with a subtle nod to the repeating presence of the number 2.

$diameter\ = 240 = 1 \times 2 \times 3 \times 5 \times 8$

$fibonacci\ = 1,\ 2,\ 3,\ 5,\ 8...$

Within this hidden mathematical message, we unlock the secrets of the Great Pyramid's dimensions, finding a symphony of numbers that harmonize with the enigma of its design, and leading us to a deeper understanding of this ancient wonder.

8. The Great Tetradecagon:

Angle and their measures:

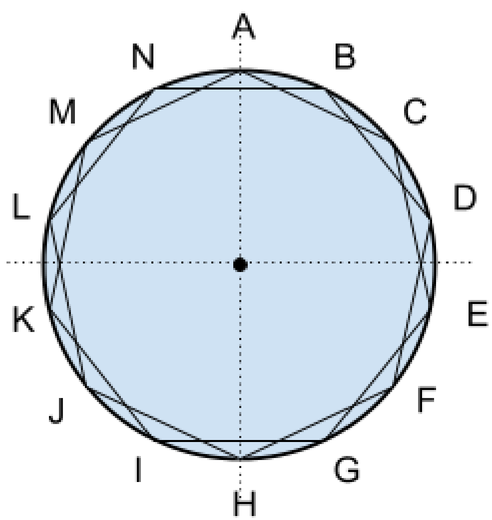
Angle Names	Sine	Cosine
$A = \pi/2$	120	0
$B = 5\pi/14$	108.1162641483	52.0660486941
$C = 3\pi/14$	74.8187762230	93.8197778962
$D = \pi/14$	26.7025120748	116.9913494618
$E = 27\pi/14$	-26.7025120748	116.9913494618
$F = 25\pi/14$	-74.8187762230	93.8197778962
$G = 23\pi/14$	-108.1162641483	52.0660486941
$H = 3\pi/2$	-120	0
$I = 19\pi/14$	-108.1162641483	-52.0660486941
$J = 17\pi/14$	-74.8187762230	-93.8197778962
$K = 15\pi/14$	-26.7025120748	-116.9913494618
$L = 13\pi/14$	26.7025120748	-116.9913494618
$M = 11\pi/14$	74.8187762230	-93.8197778962
$N = 9\pi/14$	108.1162641483	-52.0660486941

Angle Measures:

Angle Name	Tangent	Degree
$A = \pi/2$	Undef.	90
$B = 5\pi/14$	249.1825675887	64.2857142857
$C = 3\pi/14$	95.6968066659	38.5714285714
$D = \pi/14$	27.3892169268	12.8571428571
$E = 27\pi/14$	-27.3892169268	347.1428571429
$F = 25\pi/14$	-95.6968066659	321.4285714286
$G = 23\pi/14$	-249.1825675887	295.7142857143
$H = 3\pi/2$	Undef.	270
$I = 19\pi/14$	249.1825675887	244.2857142857
$J = 17\pi/14$	95.6968066659	218.5714285714
$K = 15\pi/14$	27.3892169268	192.8571428571
$L = 13\pi/14$	-27.3892169268	167.1428571429
$M = 11\pi/14$	-95.6968066659	141.4285714286
$N = 9\pi/14$	-249.1825675887	115.7142857143

9. The Seven Circles:

The tetradecagon contains seven circles. In this section, we present the basic measurements of these circles. We will need the mathematical data from these circles to calculate all the dimensions of the Great Pyramid.



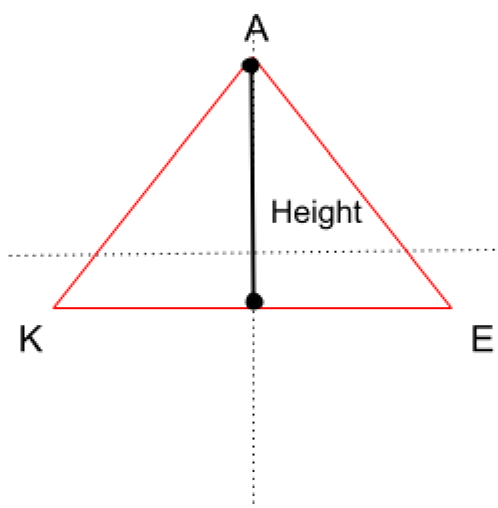
Circle Measures:

Radius number	Radius	Diameter
1	120	240
2	116.9913494618	233.9826989236
3	108.1162641483	216.2325282966
4	93.8197778962	187.6395557923
5	74.8187762230	149.6375524461
6	52.0660486941	104.1320973882
7	26.7025120748	53.4050241495

Circumference	Area	Volume
753.9822368616	45,238.9342116930	7,238,229.47387088
735.0783280056	42,998.9027767570	6,707,332.88164047
679.3145223637	36,722.4741698209	5,293,728.95669750
589.4870500000	27,652.7720518336	3,459,169.24282169
470.1002354658	17,586.1621598594	1,754,366.84168101
327.1406321577	8,516.4600418721	591,224.5643220410
167.7768315329	2,240.0314349360	79,752.6219189529

10. The Great Pyramid's Height

Now, to put it all together, let us proceed and compute what is most likely the original height of the Great Pyramid.



The pyramid height:

Measure	Meters	Feet
Pyramids height	146.7025120748	481.3074543135

Definition and Calculations:

The height of any Great Pyramid at any scale can be calculated using the formula given here, below:

$$pyramid\ height = pyramid\ radius \cdot great\ ratio$$

$$pyramid\ height = 120 \cdot (1 + sin\ \pi/14)$$

Given:

$$pyramid\ radius = 120$$

$$great\ ratio = 1 + sin(\pi/14)$$

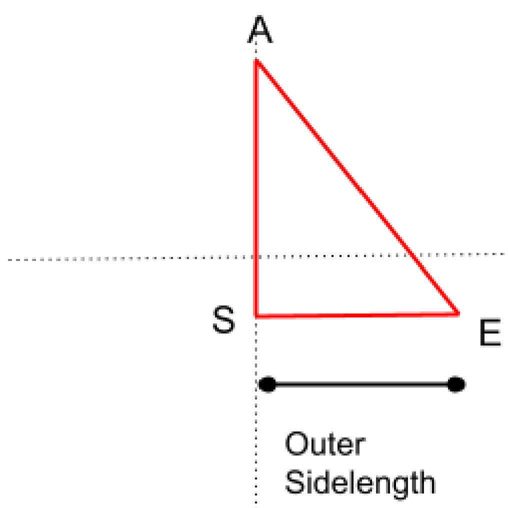
Then:

$$pyramid\ height = 120 \cdot (1 + sin\ \pi/14)$$

$$pyramid\ height \approx 146.7025120748\ meters$$

11. The Outer Sidelength

There are several ways to go about calculating the outer sidelength of the Great Pyramid – which is different from the shorter inner sidelength ending at the concavities on the sides. We use the radius and the definition of the cosine to arrive at the answer:



The pyramid's outer sidelength:

Measure	Meters	Feet
Outer Sidelength	116.9913494618	383.8298866858

Definition and Calculations:

The sidelength of any Great Pyramid at any scale can be calculated using the formula given here, below:

$Outer\ Sidelength\ =\ pyramid\ radius\ \cdot\ cos(\pi/14)$

$Outer\ sidelength\ =\ 120\ \cdot\ cos(\pi/14)$

Given:

$angle\ at\ point\ D\ =\ \pi/14$

$angle\ at\ point\ E\ =\ 27\pi/14$

$pyramid\ radius\ =\ 120$

$hypotenuse\ =\ pyramid\ radius$

$cos\ \theta\ =\ adjacent\ side\ /\ hypotenuse$

$adjacent\ side\ =\ hypotenuses\ \cdot\ cos\ \theta$

$cos(27\pi/14)\ \approx\ 0.9749279122$

$cos(\pi/14)\ \approx\ 0.9749279122$

$cos(\pi/14)\ =\ cos(27\pi/14)$

Then:

$a\ =\ cos(\pi/14)$

$h\ =\ hypotenuse\ =\ 120$

$Outer\ sidelength\ =\ a\ \cdot\ h$

$$Outer\ sidelength\ =\ adjacent\ side$$

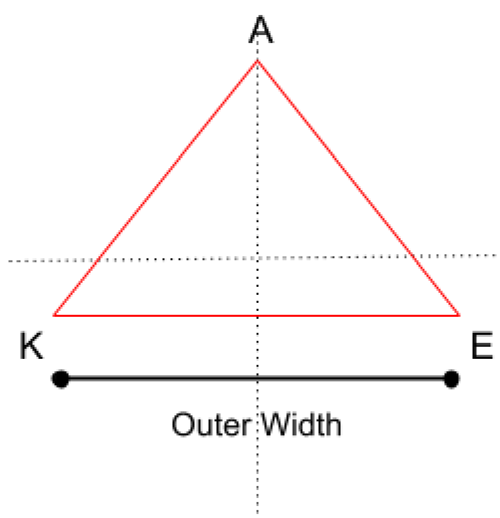
$$Outer\ sidelength\ =\ pyramid\ radius\ \cdot\ cos(\pi/14)$$

$$Outer\ sidelength\ =\ 120\ \cdot\ cos(\pi/14)$$

$$Outer\ sidelength\ \approx\ 116.9913494618\ meters$$

12. The Outer Width

The outer width of the pyramid is the distance between two consecutive corners along one side. This measurement is twice the length of the outer edge of the pyramid's base.



The pyramid's outer width:

Measure	Meters	Feet
Outer Width	233.9826989236	767.6597733715

Definition and Calculations:

The outer width of any Great Pyramid at any scale can be calculated using the formula given here, below:

Given:

$Outer\ sidelength\ =\ 120\ \cdot\ cos(\pi/14)$

$outer\ sidelength\ \approx\ 116.9913494618\ meters$

Let:

$a\ =\ Outer\ sidelength$

$b\ =\ width\ width$

Then:

$b\ =\ Outer\ width$

$b\ =\ 2\ \cdot\ a$

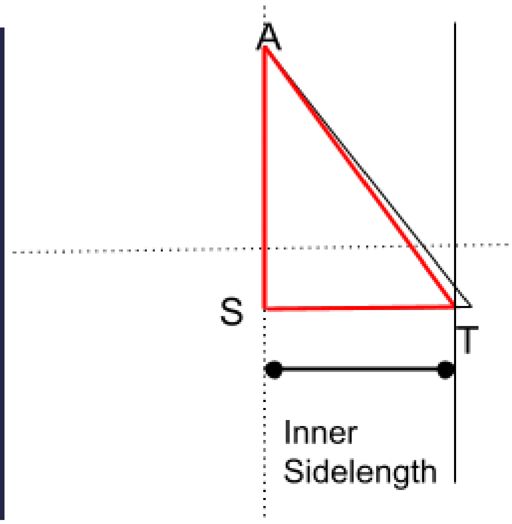
$b\ =\ 2\ \cdot\ (120\ \cdot\ cos(\pi/14\ )$

$b\ =\ 240\ \cdot\ cos(\pi/14)$

$b\ \approx 233.9826989236$

$outer\ width\ \approx\ 233.9826989236\ meters$

13. The Inner Sidelength



We have already discussed the existence of the pyramid fractal and the iterations of different pyramids. One of the byproducts of these iterations is the formation of the Inner Sidelength or concavities in the pyramid. Here is a formula that stems from the shifting of the angles of the Dodecagon, thus producing the formula for the Inner Sidelengths or Concavities of the pyramid. Said formula is presented here without its proof, for the time being (the proof is the topic of a future chapter).

The pyramid's inner sidelength:

Measure	Meters	Feet
Inner sidelength	114. 6966424972	376. 3013205288

Definition and Calculations:

The inner sidelength of any Great Pyramid at any scale can be calculated using the formula given here, below:

$$inner\ sidelength = 120 \cdot (1 + sin\ \pi/14) \cdot cos(3\pi/14)$$

$inner\ sidelength\ =\ pyramid\ height\ \cdot\ cos(C)$

Given:

$pyramid\ height\ =\ 120\ \cdot\ (1\ +\ sin\ \pi/14)$

$pyramid\ height\ \approx\ 146.7025120748\ meters$

$angle\ C\ =\ 3\pi/14$

Then:

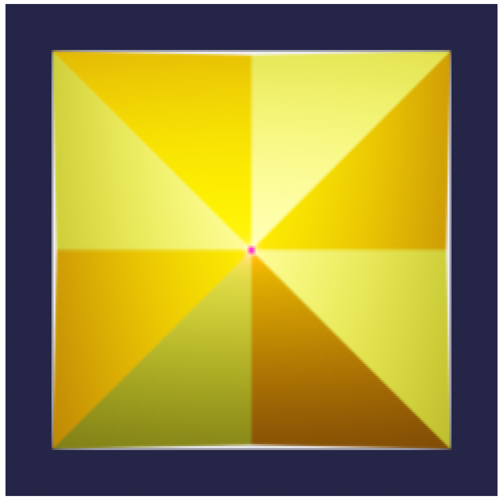
$inner\ sidelength\ =\ pyramid\ height\ \cdot\ cos(C)$

$inner\ sidelength\ =\ pyramid\ height\ \cdot\ cos(3\pi/14)$

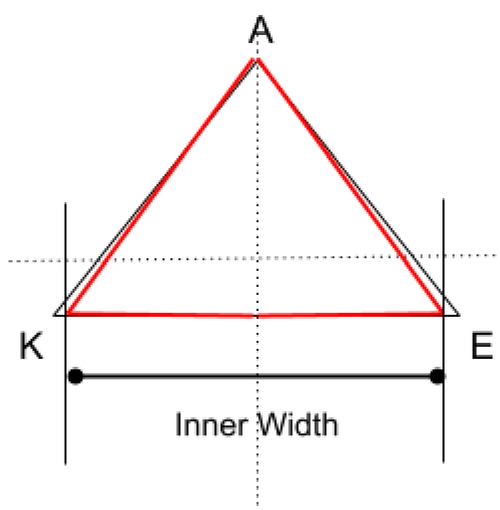
$inner\ sidelength\ =\ 120\ \cdot\ (1\ +\ sin\ \pi/14)\ \cdot\ cos(3\pi/14)$

$inner\ sidelength\ \approx\ 114.6966424972\ meters$

14. The Inner Width



The Great Pyramid features an inner width that spans from the midpoint of one side to the midpoint of the opposite side. This inner width varies from the outer width due to the necessity of accounting for the partition's length. It's this partition that defines the pyramid's eight sides, a distinctive feature often visible in aerial photographs of the pyramids.



The pyramid's inner width:

Measure	Meters	Feet
Inner sidelength	229.3932849944	752.6026410577

Definition and Calculations:

You can calculate the inner width of any Great Pyramid at any scale by employing the formula provided below.

$$inner\ width = 2 \cdot inner\ sidelength$$

$$inner\ width = 240 \cdot (1 + sin\,\pi/14) \cdot cos(3\pi/14)$$

Given:

$$inner\ sidelength = 120 \cdot (1 + sin\,\pi/14) \cdot cos(3\pi/14)$$

$$inner\ sidelength \approx 114.6966424972\ meters$$

Then:

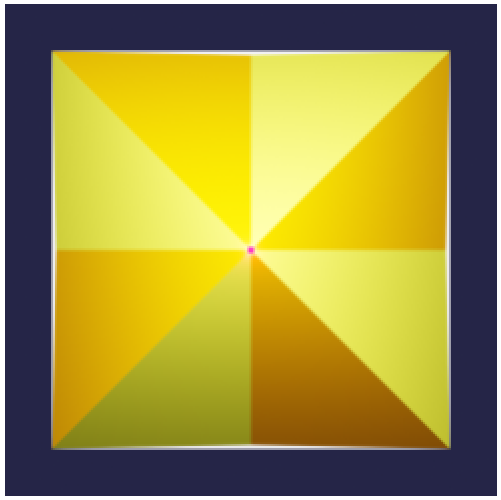
$$inner\ width = 2 \times inner\ sidelength$$

$$inner\ width = 2 \cdot 120 \cdot (1 + sin\,\pi/14) \cdot cos(3\pi/14)$$

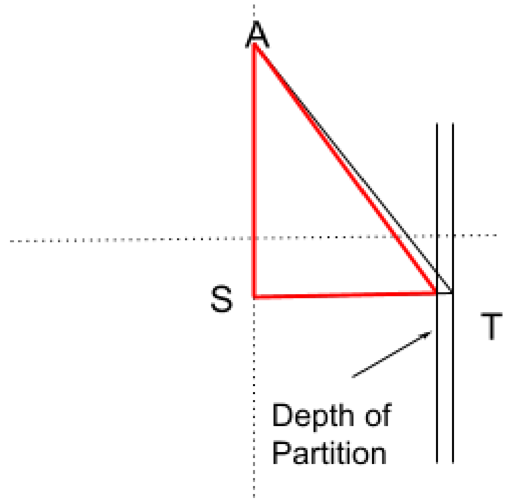
$$inner\ width = 240 \cdot (1 + sin\,\pi/14) \cdot cos(3\pi/14)$$

$$inner\ width \approx 229.3932849944\ meters$$

15. The Depth of the Partition



From an aerial perspective, The Great Pyramid shows that it contains 8 sides instead of the 4 that, for centuries, it was believed to have. The polyhedron appears to have 1 bisection on each of its 4 sides. At the ground level, these bisections start by cutting side-wide incisions into the 4 sides of the pyramid. Then, right in the middle of the side, they run straight all the way to the very top. In this section, we will calculate the dimensions of these mysterious partitions and explore the reason why they exist.



In chapter 6, the hidden frequency, in the section called: the pyramid fractal, we discover that The Great Pyramid is made up of different iterations of itself. The partitions are the result of changes in the position of the angles that occur in the tetradecagon of the pyramid as it goes from smaller to larger sizes, and vice versa. Already, we have shown that the tetradecagon is the basic figure used to design The Great Pyramid.

Partition Depth Measure:

Measure	Meters	Feet
Partition Depth	2.2947069646	7.5285661569

Definition and Calculations:

The formula provided below allows for the calculation of the partition depth of any Great Pyramid, regardless of the scale.

$$partition\ depth = outer\ sidelength - inner\ sidelength$$

$$partition\ depth = 120 \cdot (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14))$$

Given:

$a = Outer\ sidelength = 120 \cdot cos(\pi/14)$

$b = inner\ sidelength = 120 \cdot (1 + sin\,\pi/14) \cdot cos(3\pi/14)$

$outer\ sidelength \approx 116.9913494618\ meters$

$inner\ sidelength \approx 114.6966424972\ meters$

Then:

$partition\ depth = a - b$

$partition\ depth = 120 \cdot cos(\pi/14) - 120 \cdot (1 + sin\,\pi/14) \cdot cos(3\pi/14)$

$partition\ depth = 120 \cdot (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14))$

$partition\ depth \approx 2.294706964\ meters$

16. Volume of The Great Pyramid

We've now compiled sufficient data for a precise determination of the Great Pyramid's volume. All that's required are the pyramid's height, width, and partition depth. We can readily apply the standard formula for calculating the volume of a regular pyramid, which perfectly suits the Great Pyramid due to its regular shape.

Volume:

Great Pyramid	$meters^3$	$feet^3$
Volume	$2,624,706.47538255$	$8,611,241.71713435$

Definition and Calculations:

You can determine the volume of any Great Pyramid, regardless of its scale, by employing the formula provided below.

Volume of the Great Pyramid

$V = \frac{1}{3} A_B \cdot h$

$V = \frac{1}{3} A_B \cdot 120 \cdot (1 + sin\,\pi/14)$

$A_B = (240 \cdot cos(\pi/14))^2 - 4 \cdot (120^2 \cdot cos(\pi/14) \cdot (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14)))$

$r = pyramid\,radius = 120$

General formula for the volume of a Great Pyramid at any scale

$V = \frac{1}{3} A_B \cdot r \cdot (1 + sin\,\pi/14)$

$r = pyramid\,radius$

$A_B = (2 \cdot r \cdot cos(\pi/14))^2 - 4 \cdot (r^2 \cdot cos(\pi/14) \cdot (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14)))$

Given:

$pyramid\ height = 120 \cdot (1 + sin\,\pi/14)$

$pyramid\ height \approx 146.7025120748\ meters$

$outer\ sidelength = 120 \cdot cos(\pi/14)$

$outer\ sidelength \approx 116.9913494618\ meters$

$outer\ width = 240 \cdot cos(\pi/14)$

$outer\ width \approx 233.9826989236\ meters$

$inner\ sidelength = 120 \cdot (1 + sin\,\pi/14) \cdot cos(3\pi/14)$

$inner\ sidelength \approx 114.6966424972\ meters$

Partition depth (from chapter Depth of the Partition):

$partition\ depth = 120 \cdot ((cos(\pi/14) - (1 + sin\,(\pi/14) \cdot cos(3\pi/14)))$

$partition\ depth \approx 2.294706964\ meters$

Area of the square base surrounding the pyramid:

$b = pyramid\ outer\ width$

$b = 240 \cdot cos(\pi/14)$

$A = Square\ base\ area$

$A = b \cdot b$

$A = (240 \cdot cos(\pi/14))^2$

$A \approx 54,747.9033955897\ meters^2$

Area of the outside triangle of the partition:

$area\ triangle = (b \cdot c) / 2$

$b = 240 \cdot cos(\pi/14)$

$c = 120 \cdot ((cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14)))$

$b \cdot c = 240 \cdot cos(\pi/14)) \cdot 120 \cdot ((cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14)))$

$b \cdot c = 2 \cdot 120 \cdot cos(\pi/14)) \cdot 120 \cdot ((cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14)))$

$b \cdot c = 120 \cdot 120 \cdot 2 \cdot cos(\pi/14)) \cdot ((cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14))))$

$b \cdot c = 120^2 \cdot 2 \cdot cos(\pi/14)) \cdot ((cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14))))$

$area\ triangle = (b \cdot c) / 2$

$area\ triangle = 120^2 \cdot cos(\pi/14)) \cdot ((cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14))))$

$area\ triangle \approx 268.4608644111\ meters^2$

Area of square base of pyramid:

$area\ base = Area\ Square - 4 \cdot Area\ triangle$

$A_B = (240 \cdot cos(\pi/14))^2 - 4 \cdot (120^2 \cdot cos(\pi/14) \cdot (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14)))$

$area\ base \approx 53,674.0599379451$

Volume of the Great Pyramid

$V = \frac{1}{3} A_B \cdot h$

$h = pyramid\ height = 120 \cdot (1 + sin\,\pi/14)$

$A_B = (240 \cdot cos(\pi/14))^2 - 4 \cdot (14400 \cdot cos(\pi/14) \cdot (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14)))$

$V = \frac{1}{3} A_B \cdot 120 \cdot (1 + sin\,\pi/14)$

$V \approx 2,624,706.4753825500\ meters^3$

Volume of the Great Pyramid Sphere

$V = \frac{4}{3} \pi \cdot r^3$

$r = pyramid\ radius = 120$

$V = \frac{4}{3} \pi \cdot (120)^3$

$great\ sphere\ volume \approx 7,238,229.47387088\ meters^3$

Great Volume Ratio

$great\ volume \approx 2,624,706.4753825500\ meters^3$

$great\ sphere\ volume \approx 7,238,229.47387088\ meters^3$

$great\ volume\ ratio = a\ /\ b$

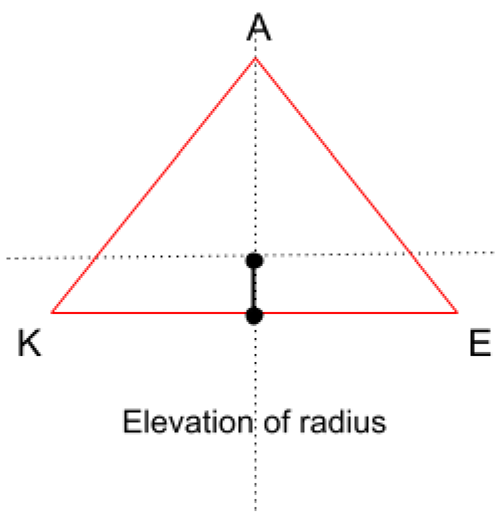
$great\ volume\ ratio \approx 2.7577291182\ meters^3$

Key Measures:

Great Pyramid	Measure	Feet
Volume	$2,624,706.47538255\ m^3$	$8,611,241.71713435\ f^3$
Sphere	$7,238,229.47387088\ m^3$	
Ratio	2.7577291182	

17. Elevation of the Great Radius

The vertical elevation of the central radius within a Great Pyramid is the measurement from ground level to the precise height at which it is situated.



Radius Elevation:

Radius	Meters	Feet
Elevation	26.7025120748	87.606669119

Definition and Calculations:

You can determine the vertical height or elevation of any Great Pyramid, regardless of its scale, by utilizing the formula provided below:

$radius\ elevation\ =\ great\ radius\ \cdot\ sin(\pi/14)$

Given:

$pyramid\ radius\ =\ 120$

$Angle\ at\ point\ D\ =\ \pi/14$

$Angle\ at\ point\ E\ =\ 27\pi/14$

$sin(27\pi/14)\ \approx\ -\ 0.2225209340$

$sin(\pi/14)\ =\ |sin(27\pi/14)|\ \approx\ 0.2225209340$

Let:

$a\ =\ 120$

$b\ =\ sin(\pi/14)$

Then:

$radius\ elevation\ =\ a\ \cdot\ b$

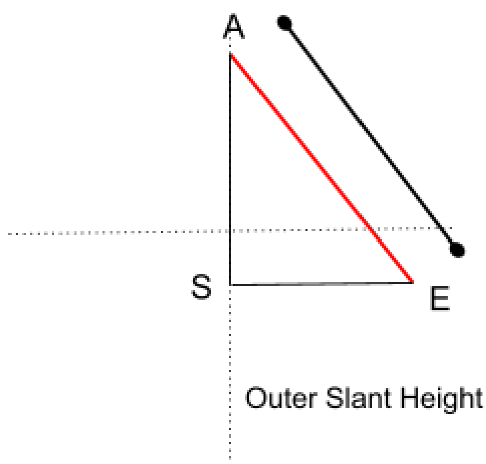
$radius\ elevation\ =\ 120\ \cdot\ sin(\pi/14)$

$radius\ elevation\ \approx\ 26.7025120748\ meters$

$radius\ elevation\ \approx\ 87.6066669119\ feet$

18. The Outer Slant height

The Great Pyramid's outer slant height is the measurement from the corners of one of its sides to the apex or pinnacle, effectively representing the outermost hypotenuse of this remarkable architectural marvel.



Outer Slant Height:

Slant Height	Meters	Feet
Measure	187. 6395557923	615. 6153405260

Definition and Calculations:

The formula provided below can be used to calculate the outer slant height of any Great Pyramid, regardless of its scale.

$$outer\ slant\ height\ =\ 120\sqrt{2}\cdot\sqrt{1\ +\ sin\ \pi/14}$$

$$outer\ slant\ height\ \approx\ 187.6395557923\ meters$$

Let:

$$outer\ slant\ height\ =\sqrt{a^2\ +\ b^2}$$

$$c\ =\ outer\ slant\ height$$

$$a\ =\ pyramid\ height$$

$$b\ =\ outer\ sidelength$$

Given:

$$pyramid\ radius\ =\ 120$$

$$pyramid\ height\ =\ 120\ \cdot\ (1\ +\ sin\ \pi/14)$$

$$pyramid\ height\ \approx\ 146.7025120748\ meters$$

$$outer\ sidelength\ =\ 120\ \cdot\ cos(\pi/14)$$

$$outer\ sidelength\ \approx\ 116.9913494618\ meters$$

$$c\ =\sqrt{a^2\ +\ b^2}$$

Let:

$a \approx 146.7025120748$

$b \approx 116.9913494618$

$c = outer\ slant\ height$

Then:

$c = \sqrt{a^2 + b^2}$

$c = \sqrt{(120 \cdot (1 + sin\, \pi/14))^2 + (120 \cdot cos(\pi/14)^2}$

$c = 120 \cdot \sqrt{1 + 2 \cdot sin\, \pi/14 \ + (sin(\pi/14)^2 + (cos(\pi/14)^2}$

$c = 120 \cdot \sqrt{1 + 2 \cdot sin\, \pi/14 + 1}$

$c = 120 \cdot \sqrt{2 + 2 \cdot sin\, \pi/14}$

$c = 120 \cdot \sqrt{2(1 + sin\, \pi/14})$

$c = 120\sqrt{2} \cdot \sqrt{1 + sin\, \pi/14}$

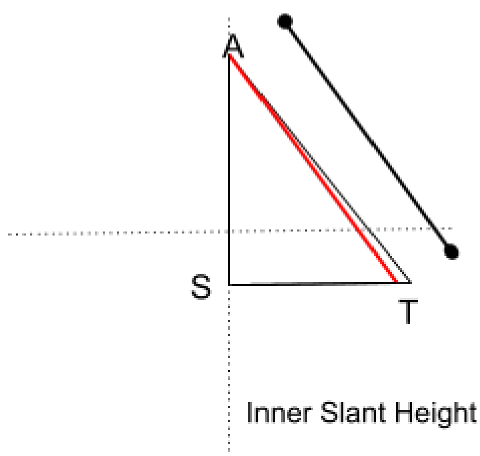
$c \approx 187.6395557923\, meters$

$Slant\ height \approx 187.6395557923\, meters$

$slant\ height \approx 615.6153405260\, feet$

19. The Inner Slant height

The inner slant height of the Great Pyramid can be described as the measurement from the midpoint of one of its sides to the apex, representing the innermost diagonal or hypotenuse within this remarkable architectural wonder.



Inner Slant Height:

Slant Height	Meters	Feet
Measure	186.2174719224	610.9497110315

Definition and Calculations:

You can determine the inner slant height of any Great Pyramid, regardless of its scale, by applying the formula provided below:

$$inner\ slant\ height\ =\ 120\ \cdot\ (1\ +\ sin\ \pi/14)\ \cdot\sqrt{1\ +\ (cos(3\pi/14))^2}$$

$$inner\ slant\ height\ \approx\ 186.2174719224\ meters$$

$$inner\ slant\ height\ =\ pyramid\ height\ \cdot\sqrt{1\ +\ (cos(3\pi/14))^2}$$

Let:

$$c\ =\sqrt{a^2\ +\ b^2}$$

$$c\ =\ inner\ slant\ height$$

$$a\ =\ \ pyramid\ height$$

$$b\ =\ inner\ sidelength$$

Given:

$$pyramid\ radius\ =\ 120$$

$$pyramid\ height\ =\ 120\ \cdot\ (1\ +\ sin\ \pi/14)$$

$$pyramid\ height\ \approx\ 146.7025120748\ meters$$

$$inner\ sidelength\ =\ 120\ \cdot\ (1\ +\ sin\ \pi/14)\ \cdot\ cos(3\pi/14)$$

$$inner\ sidelength\ \approx\ 114.6966424972\ meters$$

$$c\ =\sqrt{a^2\ +\ b^2}$$

Let:

$a \approx 146.7025120748$

$b \approx 114.6966424972$

$c = slant\ height$

Then:

$c = \sqrt{a^2 + b^2}$

$c = \sqrt{(120 \cdot (1 + sin\,\pi/14))^2 + (120 \cdot (1 + sin\,\pi/14) \cdot cos(3\pi/14))^2}$

$c = 120 \cdot \sqrt{(1 + sin\,\pi/14))^2 + ((1 + sin\,\pi/14) \cdot cos(3\pi/14))^2}$

$c = 120 \cdot (1 + sin\,\pi/14) \cdot \sqrt{1 + (cos(3\pi/14))^2}$

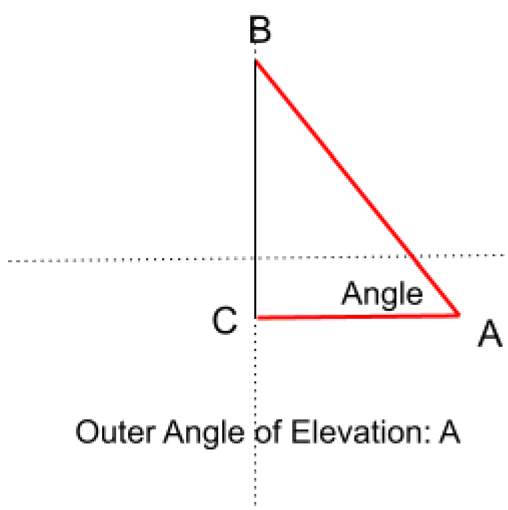
$c \approx 186.2174719224\ meters$

$inner\ slant\ height \approx 186.2174719224\ meters$

$inner\ slant\ height \approx 610.9497110315\ feet$

20. The Outer Angle of the Pyramid

The Great Pyramid's exterior ground angle measurement refers to the angular measurement that spans from the corners of its base to the outer hypotenuse, also known as the outer slant height. This measurement not only signifies the external angle but also serves as a testament to the remarkable architectural brilliance encapsulated within this extraordinary monument.



Outer angle:

Angle	Radian	Degree
Angle A	2π/7	51. 4285714286
Angle B	3π/14	38. 5714285714
Angle C	π/2	90
Angle	**Radian**	**Degree**
Angle A	0. 8975979010	51. 4285714286
Angle B	0. 6731984258	38. 5714285714
Angle C	1. 5707963268	90

Definition and Calculations:

You can ascertain the external angle of any Great Pyramid, irrespective of its size, by utilizing the formula presented here:

$$A = \frac{2\pi}{7}$$

$$B = \frac{3\pi}{14}$$

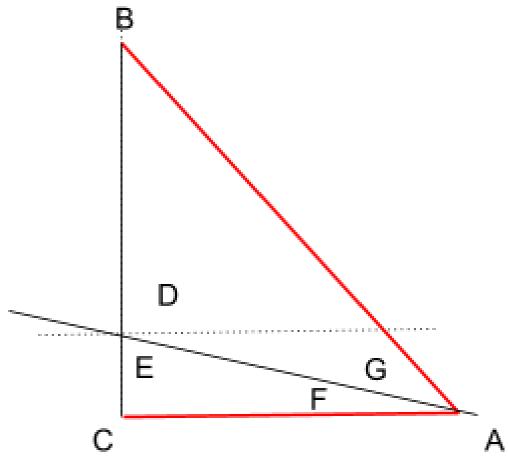
$$C = \frac{\pi}{2}$$

Given:

Figures 1 – The Tetradecagon

Figures 2 – The Great Pyramid and the Tetradecagon

Figure 3: Angles of the Side View of the Pyramid



Outer Angle of Elevation: A

Where:

$C = \frac{\pi}{2}$, $F = \frac{\pi}{14}$, $B = G$

Find: A

$$E = \frac{\pi}{2} - F = \frac{\pi}{2} - \frac{\pi}{14} = \frac{3\pi}{7}$$

$$D = \frac{\pi}{2} - E = \frac{\pi}{1} - \frac{3\pi}{7} = \frac{4\pi}{7}$$

$$B + G = \pi - D = \frac{\pi}{1} - \frac{4\pi}{7} = \frac{3\pi}{7}$$

By the Definition of Tetradecagon:

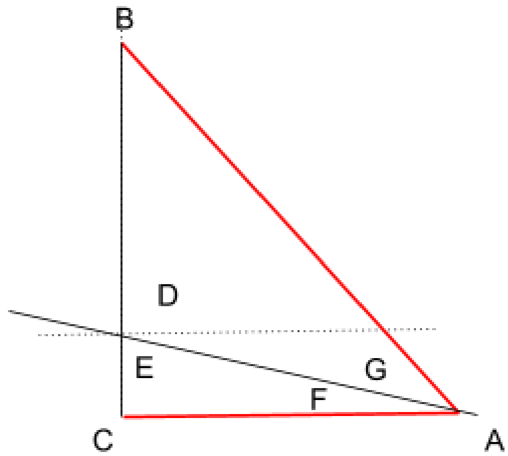
$$B = G$$

$G = \frac{(B+G)}{2} = \frac{3\pi}{7} \div \frac{2}{1} = \frac{3\pi}{14}$, $B = \frac{3\pi}{14}$, $G = \frac{3\pi}{14}$

$$A = F + G$$

$$A = \frac{3\pi}{14} + \frac{\pi}{14} = \frac{2\pi}{7}$$

Figure 3: Angles of the Side View of the Pyramid



Outer Angle of Elevation: A

Then:

$A = \frac{2\pi}{7}$, $B = \frac{3\pi}{14}$,

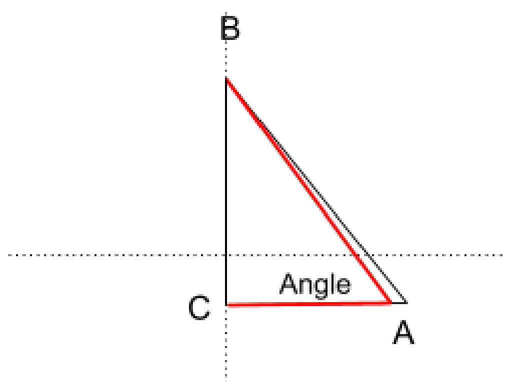
$C = \frac{\pi}{2}$, $D = \frac{4\pi}{7}$,

$E = \frac{3\pi}{7}$, $F = \frac{\pi}{14}$

$G = \frac{3\pi}{14}$,

21. The Inner Angle of the Pyramid

The internal angle of the Great Pyramid pertains to the angular measurement spanning from the midpoint partition of its sides to the inner hypotenuse, a dimension we previously referred to as the inner slant height.



Inner Angle of Elevation: A

Inner angle:

Angle	Radian	Degree
Angle A	$cot^{-1}(cos\ (3\pi/14))$	51.980584438
Angle B	$tan^{-1}(cos\ (3\pi/14))$	38.0194155620
Angle C	$\pi/2$	90
Angle	**Radian**	**Degree**
Angle A	0.9072323456	51.980584438
Angle B	0.6635639812	38.0194155620
Angle C	1.5707963268	90

Definition and Calculations:

You can ascertain the inner angle of any Great Pyramid, irrespective of its size, by utilizing the formula presented here:

$A = cot^{-1}(cos\ (3\pi/14))$

$B = tan^{-1}(cos\ (3\pi/14))$

$C = \pi/2$

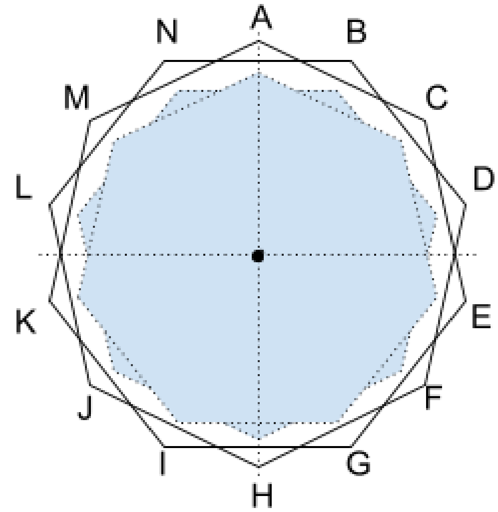
Given:

$a = pyramid\ height = 120\ (1 + sin(\pi/14) \approx 146.7025120748\ meters$

$b = inner\ sidelength = pyramid\ height\ \cdot (cos\ C)$

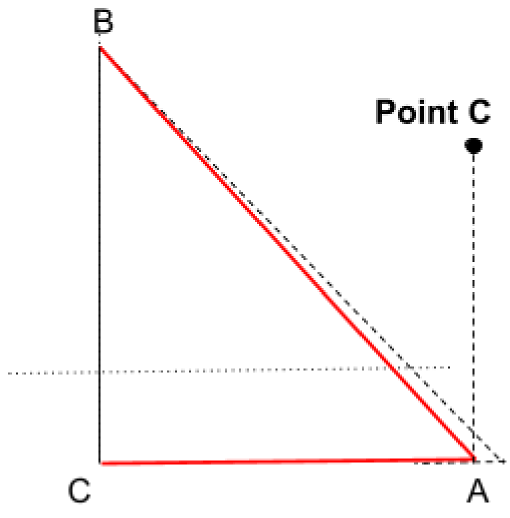
$b = inner\ sidelength = 120 \cdot (1 + sin(\pi/14)) \cdot (cos(3\pi/14)) \approx 114.6966424972\ meters$

Figure 1:



Figures 2 – The Great Pyramid and the Tetradecagon

Figure 3:



Outer Angle of Elevation: A

Then:

$tan\,\theta = \frac{a}{b}$

$tan\,\theta = \frac{120 \cdot (1+sin(\pi/14)}{(120 \cdot (1+sin(\pi/14)) \cdot cos(3\pi/14)}$

$tan\,\theta = \frac{1}{cos(3\pi/14)}$

$\theta = tan^{-1}(\frac{1}{cos(3\pi/14)})$

$\theta = tan^{-1}(sec(3\pi/14))$

$\theta \approx 0.9072323456\, rads,$

$\theta \approx 51.9805844380^{\circ}$

Then: By the rules of trigonometry

$tan\ A = \frac{1}{cos(3\pi/14)}$

$c = \sqrt{a^2 + b^2}$

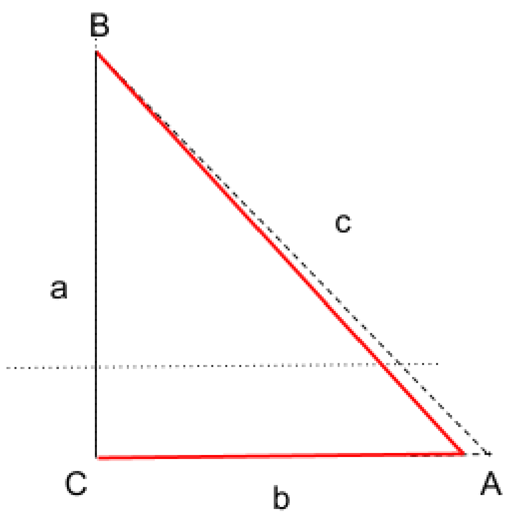
We have:

$a = 1$

$b = cos(3\pi/14)$

$c = \sqrt{1 + cos^2(3\pi/14)}$

Figure 4:



Inner Angle of Elevation: A

Then:

$cot\ A = cos(3\pi/14)$

$tan\ B = cos(3\pi/14)$

$A = tan^{-1}(\frac{1}{cos(3\pi/14)})$

$A = tan^{-1}(Sec\ (3\pi/14))$

Finally:

$cot\ A = cos(3\pi/14)$

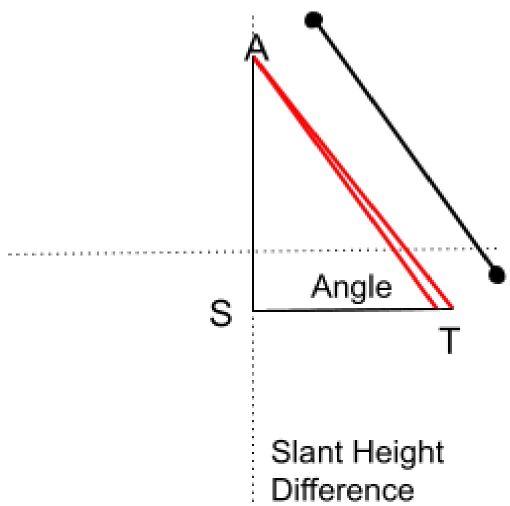
$A = cot^{-1}(cos(3\pi/14))$

$tan\ B = cos(3\pi/14)$

$B = tan^{-1}(cos(3\pi/14))$

22. Slant height difference

Now, let's move on to compute the disparity between the outer and inner slant heights based on our prior calculations.



Slant Height Difference

Slant Height	meters	feet
Measure	1.4220838699	4.6656294945

Definition and Calculations:

The formula provided below can be used to calculate the difference in slant height for any Great Pyramid, regardless of its scale.

$c = a - b$

$a = outer\ slant\ height$

$b = inner\ slant\ height$

$c = slant\ height\ difference$

Given:

$outer\ slant\ height \approx 187.6395557923\ meters$

$outer\ slant\ height \approx 186.2174719224\ meters$

Let:

$a \approx 187.6395557923$

$b \approx 186.2174719224$

$c = slant\ height$

Then:

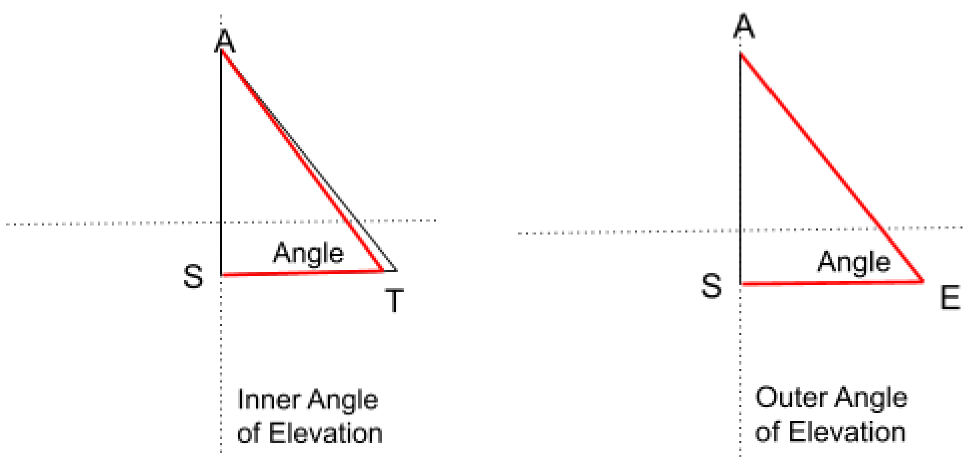
$c = a - b$
$c \approx 1.4220838699\ meters$

$slant\ height\ difference \approx 1.4220838699\ meters$

$slant\ height\ difference \approx 4.6656294944\ feet$

23. Elevation Angle difference

Now, let's move forward with calculating the disparity between the outer and inner angles of the pyramid, building on our previous calculations.



Elevation Angle Difference

Slant Height	Rads	Degrees
Measure	0.0096344445	0.5520130094

Definition and Calculations:

The difference in elevation angles for any Great Pyramid, regardless of its scale, can be determined using the formula provided below.

$c = tan^{-1}(Sec\,(3\pi/14)) - 2\pi/7$

$c = a - b$

$a = inner\ elevation\ angle$

$b = outer\ elevation\ angle$

$c = elevation\ angle\ difference$

Given:

$inner\ elevation\ angle = tan^{-1}(Sec\,(3\pi/14)) = 0.9072323456\ rads$

$outer\ elevation\ angle = 2\pi/7 = 0.8975979010\ rads$

Let:

$a = inner\ elevation\ angle = tan^{-1}(Sec\,(3\pi/14))$

$b = outer\ elevation\ angle = 2\pi/7$

$c = elevation\ angle\ difference$

Then:

$c = a - b$

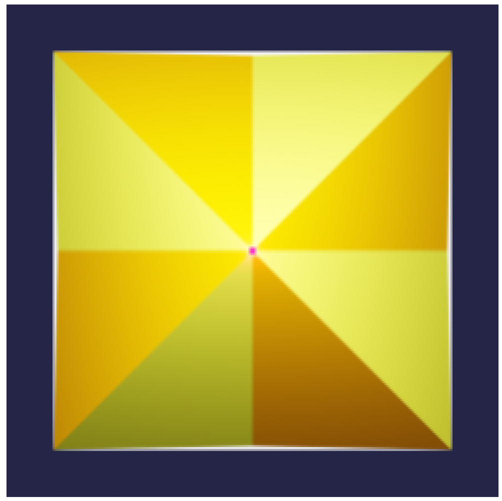
$c = tan^{-1}(Sec\,(3\pi/14)) - 2\pi/7$

$c \approx 0.0096344445\, rads$

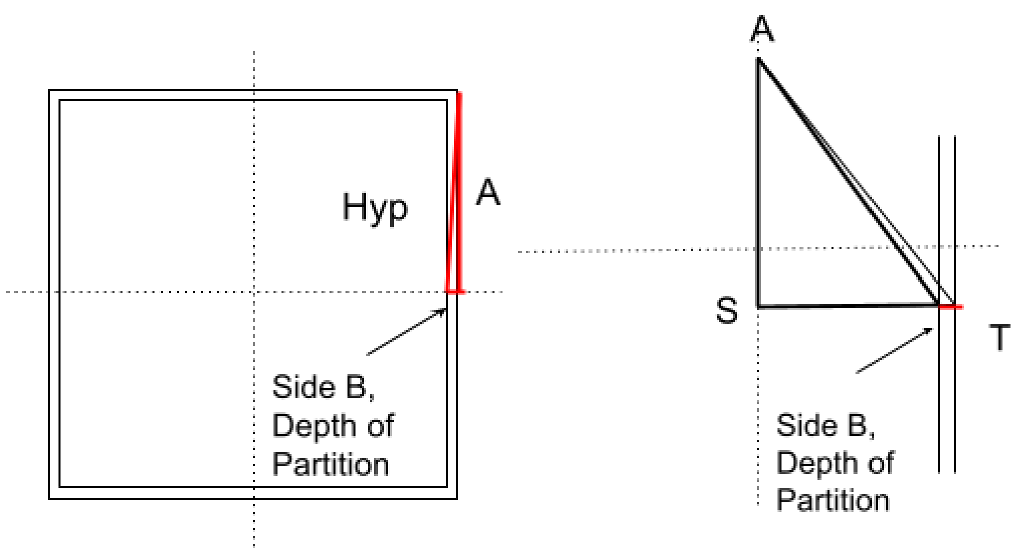
$elevation\ angle\ difference \approx 0.0096344445\, rads$

$elevation\ angle\ difference \approx 0.5520130094^{\circ}$

24. Measures of the Partition



The measurement of the pyramid's partition is a critical factor for calculating the perimeter of the pyramid's base. This measurement is analogous to determining the length of a hypotenuse.



Measures of The Partition:

Measures	Meters	Feet
Hypotenuse	117.0138518678	383.9037134770341
Side A	116.9913494618	383.8298866856955
Side B	2.2947069646	7.52856615682415
Pyramid's Sidelength	$233.9826989236\ meters$	767.659773371391

Definition and Calculations:

The formulas provided below can be used to calculate the measurements of partitions for any scale of the Great Pyramid.

$$c = \sqrt{a^2 + b^2}$$

$$c = Partition's\ Hypotenuse$$

$$c = 120 \cdot \sqrt{(cos(\pi/14))^2 + (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14))^2}$$

$$d = Pyramid's\ Sidelength$$

$$d = 2 \cdot c$$

$$d = 240 \cdot \sqrt{(cos(\pi/14))^2 + (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14))^2}$$

Given:

$$partition\ depth = 120 \cdot (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14))$$

$$a = Outer\ sidelength = 120 \cdot cos(\pi/14)$$

$$c = \sqrt{a^2 + b^2}$$

$$d = 2 \times c$$

$$Outer\ sidelength = 120 \cdot cos(\pi/14)$$

$$Outer\ sidelength \approx 116.9913494618\ meters$$

Hypotenuse of the Partition:

$c = \sqrt{a^2 + b^2}$

$a = Outer\ sidelength = 120 \cdot cos(\pi/14)$

$b = partition\ depth = 120 \cdot (cos(\pi/14) - (1 + sin\ \pi/14) \cdot cos(3\pi/14))$

$c = \sqrt{(120 \times cos(\pi/14))^2 + (120 \cdot (cos(\pi/14) - (1 + sin\ \pi/14) \cdot cos(3\pi/14)))^2}$

$c = \sqrt{(120)^2 (cos(\pi/14))^2 + (cos(\pi/14) - (1 + sin\ \pi/14) \cdot cos(3\pi/14))^2}$

$c = 120 \cdot \sqrt{(cos(\pi/14))^2 + (cos(\pi/14) - (1 + sin\ \pi/14) \cdot cos(3\pi/14))^2}$

$c = 117.0138518678\ meter$

Pyramid's Sidelength Width:

$d = 2 \times c$

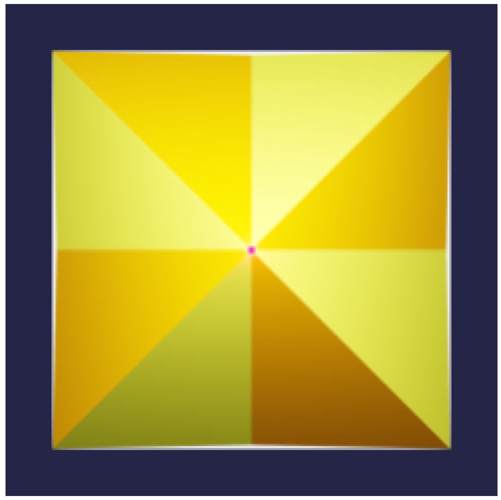
$d = 2 \cdot 120 \cdot \sqrt{(cos(\pi/14))^2 + (cos(\pi/14) - (1 + sin\ \pi/14) \cdot cos(3\pi/14))^2}$

$d = 240 \cdot \sqrt{(cos(\pi/14))^2 + (cos(\pi/14) - (1 + sin\ \pi/14) \cdot cos(3\pi/14))^2}$

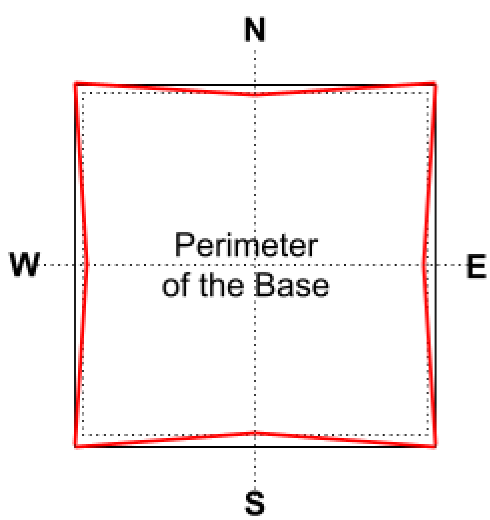
$d \approx 233.9826989236\ meters$

$d \approx 767.659773371391\ feet$

25. Perimeter of the base



In the previous section, we successfully calculated the hypotenuse of the partition. Now that we have this value, we can proceed to determine the perimeter of the Great Pyramid's base, considering the pyramid's eight sides.



Measure perimeter of the base:

Perimeter of the Base	Meters	Feet
Inner Measure	936. 1108149424	3, 071. 229707816273
Outer Measure	935. 9307956946	3, 070. 6390934861
Difference	0. 1800192482	0. 5906143315

Definition and Calculations:

The formula presented below can be utilized to determine the perimeter of the base of the Great Pyramid, regardless of the scale.

$p = 8 \cdot c$

$p = 960 \cdot \sqrt{(cos(\pi/14))^2 + (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14))^2}$

$p = 8 \cdot 120 \cdot \sqrt{(cos(\pi/14))^2 + (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14))^2}$

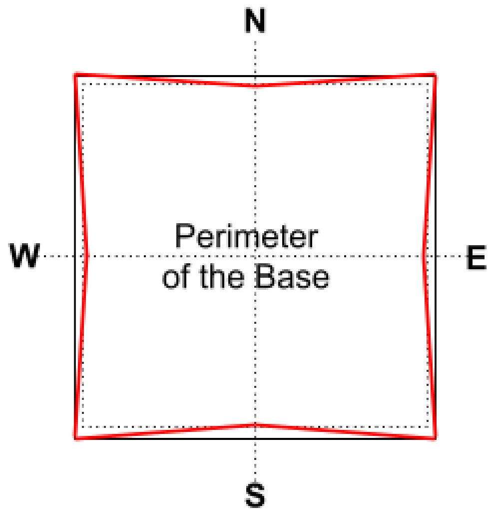
Given:

$c = Partition's\ Hypotenuse$

$c = 120 \cdot \sqrt{(cos(\pi/14))^2 + (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14))^2}$

$p \approx 117.0138518678\ meters$

Inner Side Length:



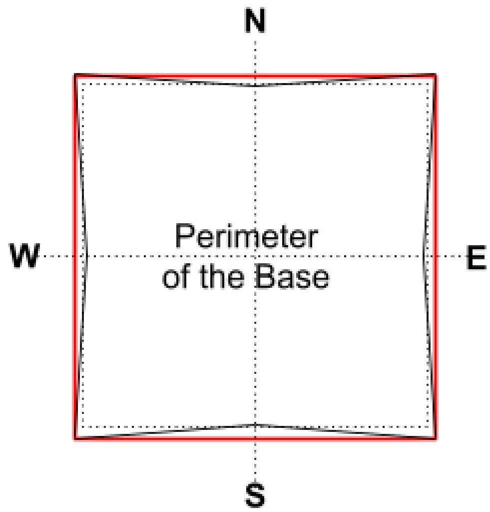
$$p = 8 \cdot 120 \cdot \sqrt{(cos(\pi/14))^2 + (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14))^2}$$

$$p = 960 \cdot \sqrt{(cos(\pi/14))^2 + (cos(\pi/14) - (1 + sin\,\pi/14) \cdot cos(3\pi/14))^2}$$

$$p \approx 8 \cdot 117.0138518678\, m$$

$$p \approx 936.1108149424\, meters$$

Outer Side Length:



$Outer\ sidelength\ =\ 120\ \cdot\ cos(\pi/14)$

$Outer\ sidelength\ \approx\ 116.9913494618\ meters$

$p\ =\ 8\ \cdot\ 120\ \cdot\ cos(\pi/14)$

$p\ =\ 935.9307956946\ meters$

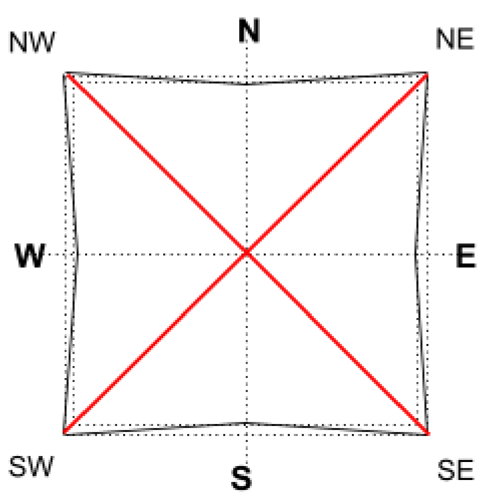
Difference:

$p\ =\ 960\ \cdot \sqrt{(cos(\pi/14))^2\ +\ (cos(\pi/14)\ -\ (1\ +\ sin\ \pi/14)\ \cdot\ cos(3\pi/14))^2}\ -\ 120\ \cdot\ cos(\pi/14)$

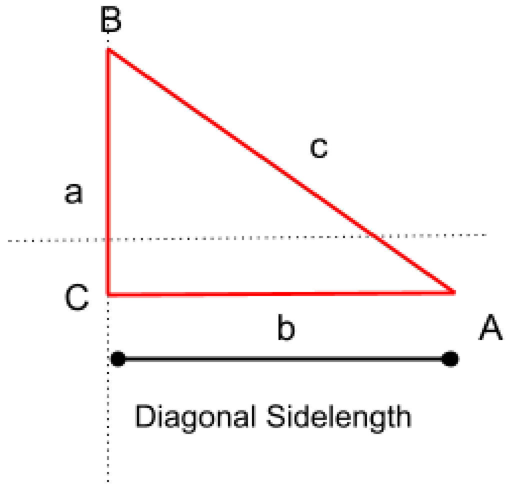
$p\ =\ 0.1800192482$

26. Pyramid Diagonal Measures

Diagonal measurements of the pyramid are taken from the center to the northwest, northeast, southeast, and southwest corners of the Great Pyramid. They are as follows:



Diagonal Measures



Diagonal Measures:

Measures	Meters	Feet
Pyramid's Height (a)	146.7025120748	481.3074543135
Diagonal Sidelength (b)	165.4507530892	542.8174313951
Diagonal Slant Height (c)	221.1234468500	725.4706261484
Pyramid's Sidelength	116.9913494618	383.8298866858
Total Diagonal Width	330.9015061785	$1,085.6348627903$

Angle of Elevation:

Diagonal side angle A			
Angle	**Radian**	**Radian**	**Degree**
A	$tan^{-1}(\frac{1+sin(\pi/14)}{\sqrt{2}\cdot cos(\pi/14)})$	0.7254092153	41.5628864579
B	$tan^{-1}(\frac{\sqrt{2}\cdot cos(\pi/14)}{1+sin(\pi/14)})$	0.8453871115	48.4371135421
C	$\pi/2$	1.5707963268	90

Definition and Calculations:

The formula presented below can be utilized to determine the perimeter of the base of the Great Pyramid, regardless of the scale.

$a\ =\ pyramid\ height\ =\ 120\ \cdot\ (1\ +\ sin(\pi/14)$

$b\ =\ 120\sqrt{2}\ \cdot\ cos(\pi/14)$

$c\ =\ 120\ \cdot\ \sqrt{2\ +\ 2\ \cdot\ sin(\pi/14)\ +\ (cos(\pi/14))^2}$

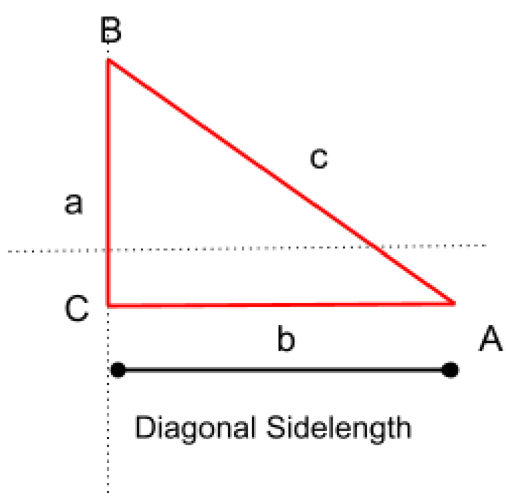
$d\ =\ Outer\ sidelength\ =\ 120\ \cdot\ cos(\pi/14)$

$\theta\ =\ Angle\ of\ elevation\ A\ =\ tan^{-1}(\frac{1+sin(\pi/14)}{\sqrt{2}\cdot cos(\pi/14)})$

$Angle\ B\ =\ \pi/2\ \ -\ tan^{-1}(\frac{1+sin(\pi/14)}{\sqrt{2}\ \cdot cos(\pi/14)})$

$Angle\ B\ =\ tan^{-1}(\frac{\sqrt{2}\ \cdot\ cos(\pi/14)}{1+sin(\pi/14)})$

Given:



$side\ a\ =\ pyramid\ height$

$side\ b\ =\ diagonal\ sidelength$

$side\ c\ =\ diagonal\ slant\ height$

$side\ d\ =\ pyramid's\ sidelength$

$side\ e\ =\ total\ diagonal\ width$

$slope\ f\ =\ diagonal\ angle\ of\ elevation$

Definition and Calculations:

The lateral measures of any Great Pyramid at any scale can be calculated using the formulas given here, below:

$a\ =\ pyramid\ height$

$b\ =\ diagonal\ sidelength$

$c\ =\ Diagonal\ Hypotenuse$

$d\ =\ sidelength$

$e\ =\ total\ lateral\ width$

$f\ =\ angle\ of\ elevation$

$b\ =\ d\ \cdot\ \sqrt{2}$

$c\ =\sqrt{a^2\ +\ b^2}$

$e\ =\ 2\ \cdot\ b$

$f\ =\ tan^{-1}(a/b)$

Given:

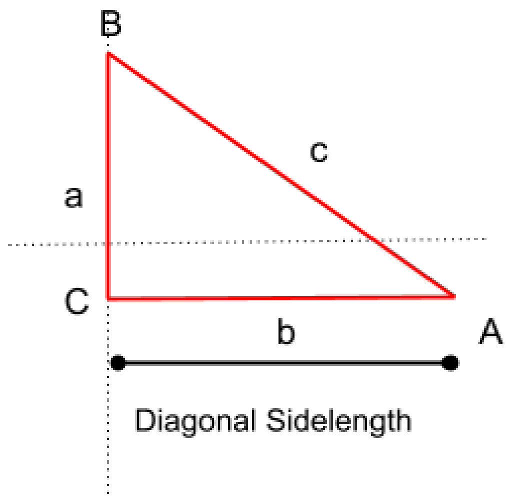
$a\ =\ pyramid\ height\ =\ 120\ \cdot\ \ (1\ +\ sin(\pi/14)$

$d\ =\ Outer\ sidelength\ =\ 120\ \cdot\ cos(\pi/14)$

$pyramid\ height\ \approx\ 146.7025120748\ meters$

$sidelength\ \approx\ 116.9913494618\ meters$

The diagonal sidelength:



$b = d \cdot \sqrt{2}$

$b = 120 \cdot \sqrt{2} \cdot cos(\pi/14)$

$b \approx 165.4507530892$

The diagonal hypotenuse:

$c = \sqrt{a^2 + b^2}$

$c = \sqrt{(120 \cdot (1 + sin(\pi/14))^2 + (120 \cdot \sqrt{2} \cdot cos(\pi/14))^2}$

$c = 120 \cdot \sqrt{(1 + 2 \cdot sin(\pi/14)) + (sin(\pi/14))^2 + 2 \cdot (cos(\pi/14))^2}$

$c = 120 \cdot \sqrt{(1 + 2 \cdot sin(\pi/14)) + (sin(\pi/14))^2 + (cos(\pi/14))^2 + (cos(\pi/14))^2}$

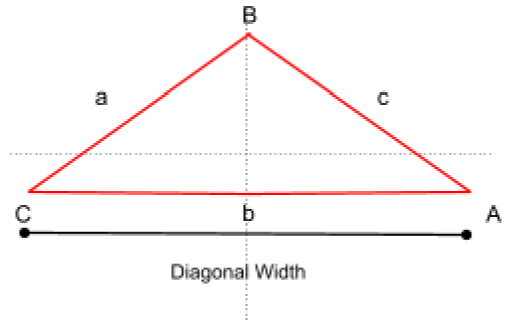
$c = 120 \cdot \sqrt{(1 + 2 \cdot sin(\pi/14)) + 1 + (cos(\pi/14))^2}$

$c = 120 \cdot \sqrt{2 + 2 \cdot sin(\pi/14) + (cos(\pi/14))^2}$

$c = 120 \cdot \sqrt{2 \cdot (1 + sin(\pi/14)) + (cos(\pi/14))^2}$

$c \approx 221.1234468500$

Diagonal width:



$e = 2 \times b$

$e \approx 330.9015061785$

Diagonal Angles:

$\theta = tan^{-1}(\frac{a}{b})$

$\theta = tan^{-1}(\frac{120\ (1+sin(\pi/14)}{120\sqrt{2}\cdot cos(\pi/14)})$

$\theta = tan^{-1}(\frac{1+sin(\pi/14}{\sqrt{2}\cdot cos(\pi/14)})$

$\theta \approx 0.7254092153\ rads$

$\theta \approx 41.5628864579^{\circ}$

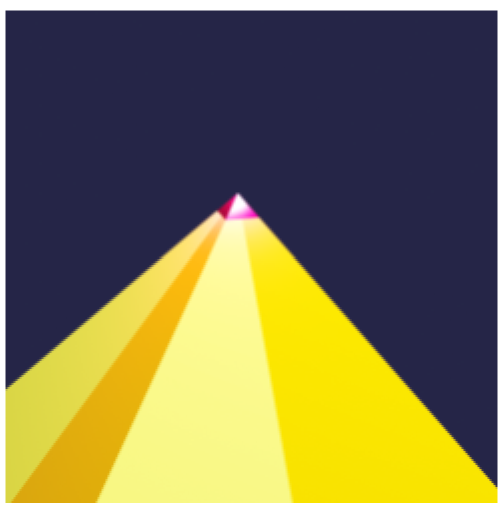
$Angle\ of\ elevation = tan^{-1}(\frac{1+sin(\pi/14}{\sqrt{2}\cdot cos(\pi/14)})$

$Angle\ B = \pi/2 - tan^{-1}(\frac{1+sin(\pi/14}{\sqrt{2}\cdot cos(\pi/14)})$

$Angle\ B = tan^{-1}(\frac{\sqrt{2}\cdot cos(\pi/14)}{1+sin(\pi/14)})$

27. Capstone Measures

The apex of the Great Pyramid is itself a miniature pyramid. Employing consistent mathematical formulas, we can ascertain the specific dimensions of this capstone. Presented here are the measurements for the original capstone of the Great Pyramid, beginning with the calculation of its diameter, radius, and the altitude of the radius.



Measure of diameter and radius

Capstone	Meters	Feet
Diameter	3.0086505382	9.8709007158
Radius	1.5043252691	4.9354503579
Radius Inner Altitude	0.3347438639	1.0982410231

Definition and Calculations:

The diameter and radius of any Great Pyramid at any scale can be calculated using the formulas given here, below:

$a = radius\ 7$ $b = radius\ 6$ $c = diameter$

$d = radius$ $e = radius\ inner\ altitude$ $c = a - b$

$d = c\,/\,2$ $e = d \cdot sin(\pi/14)$

Given:

$radius\ 7 = 120\ meters$

$radius\ 6 \approx 116.9913494618\ meters$

Let:

$a = 120$

$b \approx 116.9913494618$

$c = diameter$

$d = radius$

Then:

$c = a - b \approx 3.0086505382\, meters$

$diameter \approx 3.0086505382\, meters$

$d = c\, /\, 2 = 1.5043252691$

$radius \approx 1.5043252691\, meters$

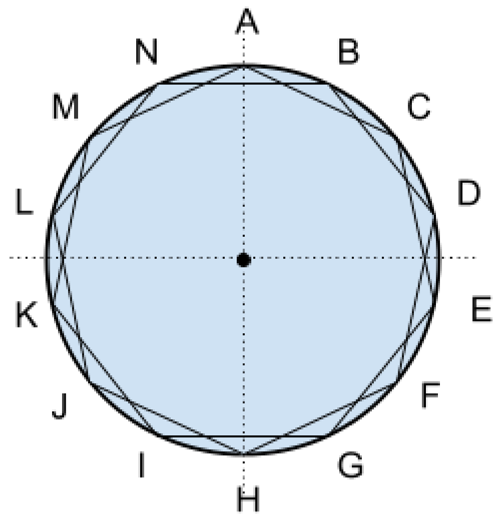
$e = d \cdot sin(\pi/14)$ $e = 0.3347438639$

$radius\ inner\ altitude = 0.3347438639\, meters$

28. The Capstone Tetradecagon

In alignment with the approach taken for the Great Pyramid, we will employ the tetradecagon as the fundamental geometric shape to derive the dimensions of its capstone. Enclosed herein is an illustration featuring the tetradecagon alongside its corresponding angular measurements.

Here are the angles (arranged clockwise): A, B, C, D, E, F, G, H I, J, K, L, M, N.



Angle Measures of the capstone tetradecagon:

Angle Name	Sine	Cosine
$A = \pi/2$	1.5043252691	0
$B = 5\pi/14$	1.3553502346	0.6527022726
$C = 3\pi/14$	0.9379314640	1.1761288552
$D = \pi/14$	0.3347438639	1.4666086938
$E = 27\pi/14$	-0.3347438639	1.4666086938
$F = 25\pi/14$	-0.9379314640	1.1761288552
$G = 23\pi/14$	-1.3553502346	0.6527022726
$H = 3\pi/2$	-1.5043252691	0
$I = 19\pi/14$	-1.3553502346	-0.6527022726
$J = 17\pi/14$	-0.9379314640	-1.1761288552
$K = 15\pi/14$	-0.3347438639	-1.4666086938
$L = 13\pi/14$	0.3347438639	-1.4666086938
$M = 11\pi/14$	0.9379314640	-1.1761288552
$N = 9\pi/14$	1.3553502346	-0.6527022726

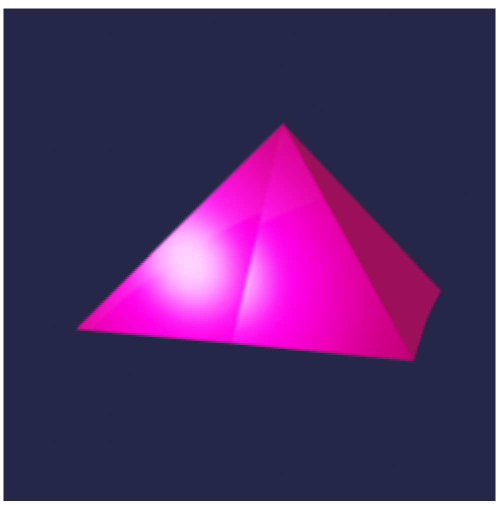
Measures of the 7 Circle in the Capstone:

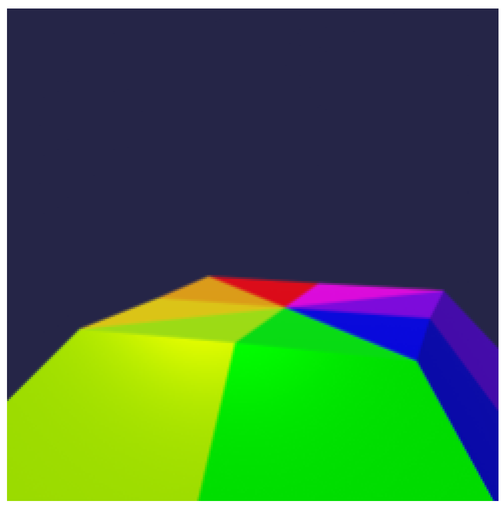
Circle	**Radius** (m)	**Diameter** (m)
1	0.3347438639	0.6694877277
2	0.6527022726	1.3054045452
3	0.9379314640	1.8758629279
4	1.1761288552	2.3522577105
5	1.3553502346	2.7107004693
6	1.4666086938	2.9332173877
7	1.5707963268	3.0086505382

Circumference (m)	**Area** (m^2)	**Volume** (m^3)
2.1032577270	0.3520263091	0.1571181959
4.1010493292	1.3383821086	1.1647533919
5.8931971935	2.7637075355	3.4562243397
7.3898355426	4.3456994086	6.8148032943
8.5159166804	5.7710248355	10.4290131534
9.2149741965	6.7573806350	13.2139109159
9.4519544280	7.1094069441	14.2598140191

29. Capstone Height and Elevation

At this juncture, we are poised to compute the critical original height and elevation above the ground level of the capstone.





Measures

Capstone	Meters	Feet
Height	1.8390691329	6.0336913810
Ground Elevation	144.8634429418	475.2737629325

Definition and Calculations:

The height of the capstone for any Great Pyramid, regardless of scale, can be determined utilizing the provided information and formulas outlined below:

$a = capstone\ radius$

$b = capstone\ radius\ inner\ altitude$

$c = pyramid\ height$

$d = capstone\ height$

$e = capstone\ ground\ elevation$

$d = a + b$

$e = c - d$

Given:

$capstone\ radius \approx 1.5043252691\ meters$

$capstone\ radius\ inner\ altitude \approx 0.3347438639\ meters$

$pyramid\ height \approx 146.7025120748\ meters$

Let:

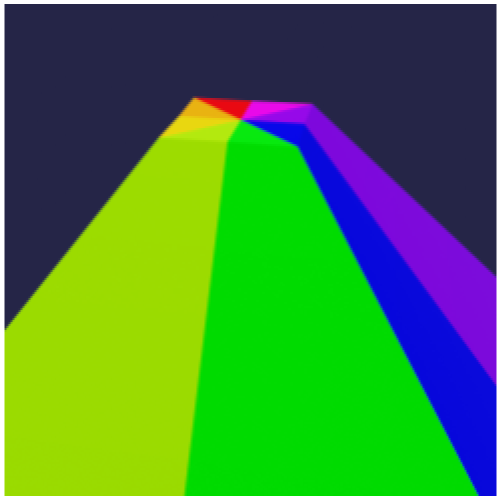
$a \approx 1.5043252691$

$b \approx 0.3347438639$

$c \approx 146.7025120748$

$d = capstone\ height$

$e = capstone\ ground\ elevation$



Then:

$d = a + b$

$d \approx 1.8390691329$

$capstone\ height \approx 1.8390691329\ meters$

$e = c - d$

$e \approx 144.8634429418$

$capstone\ ground\ elevation \approx 144.8634429418\ meters$

30. Capstone Sidelengths

Building upon the preceding calculations, we can now proceed to calculate the sidelengths and slant height of the capstone. The sidelength dimensions are measured from the center of its base to the north, south, east, or west sides. In this section, we delve into establishing two of these measures: the outer and the inner dimensions.

Measures

Capstone	Meters	Feet
Outer sidelength	1.4666086938	4.8117083131
Outer slant height	2.3522577105	7.7173809399
Inner sidelength	1.4378421466	4.7173298772
Inner slant height	2.3344304047	7.6588924037
Total Outer sidelength	2.9332173877	9.6234166262
Total Inner sidelength	2.8756842931	9.4346597544

Definition and Calculations:

The outer and inner sidelengths, as well as the outer and inner slant heights, for any Great Pyramid at any scale can be determined using the provided formulas outlined below:

$a = capstone\ radius$

$b = capstone\ height$

$angle\ C = 3\pi/14$

$angle\ D = \pi/14$

$c = outer\ sidelength$

$d = inner\ sidelength$

$e = outer\ slant\ height$

$f = inner\ slant\ height$

$c = a \cdot sin(\pi/14)$

$d = b \cdot cos(3\pi/14)$

$e = \sqrt{b^2 + c^2}$

$f = \sqrt{b^2 + d^2}$

Given:

$capstone\ radius \approx 1.5043252691\ meters$

$capstone\ height \approx 1.8390691329\ meters$

$angle\ C = 3\pi/14$

$angle\ D = \pi/14$

Let:

$a \approx 1.5043252691$

$b \approx 1.8390691329$

Then:

$c = a \cdot sin(\pi/14)$

$c \approx 1.4666086938$

$outer\ sidelength \approx 1.4666086938\ meters$

$d = b \cdot cos(3\pi/14)$

$d = 1.4378421466$

$inner\ sidelength = 1.4378421466\ meters$

$e = \sqrt{b^2 + c^2}$

$e \approx 2.3522577105$

$outer\ slant\ height \approx 2.3522577105\ meters$

$f = \sqrt{b^2 + d^2}$

$f \approx 2.3344304047$

$inner\ slant\ height \approx 2.3344304047\ meters$

$g = 2 \cdot d = 2 \cdot 1.4666086938 = 2.9332173877$

$total\ outer\ sidelength \approx 2.9332173877\ meters$

$h = 2 \cdot d = 2 \cdot 1.4378421466 = 2.8756842931$

$total\ inner\ sidelength \approx 2.8756842931\ meters$

31. Capstone Diagonal Measures

The diagonal lateral dimensions of the capstone are measured from the center to one of its corners, while the diagonal slant height is measured from the top to one of its corners.

Lateral Measures

Capstone	Meters	Feet
Diagonal Sidelength	2.0740979055	6.8047831546
Diagonal Slant Height	2.7720132390	9.0945316242
Total Dia. Sidelength	4.1481958110	13.6095663092
Total Dia. Slant Height	5.5440264781	18.1890632483

Definition and Calculations:

The diagonal sidelengths and slant heights of the capstone are illustrated below:

$a = capstone\ height$

$b = outer\ sidelength$

$c = lateral\ sidelength$

$d = lateral\ slant\ height$

$e = angle\ of\ elevation$

$f = lateral\ angle\ of\ elevation$

$g = total\ sidelength$

$h = total\ lateral\ sidelength$

$b = a \cdot \sqrt{2}$

$c = \sqrt{a^2 + c^2}$

$f = tan^{-1}(a/c)$

$g = 2 \cdot c$

$h = 2 \cdot f$

$angle\ of\ elevation \approx 2\pi/7\ rads$

$angle\ of\ elevation \approx 51.4285714286^{\circ}$

$lateral\ angle\ of\ elevation\ \approx\ 0.7254092153\ rads$

$lateral\ angle\ of\ elevation\ \approx\ 41.5628864579^{\circ}$

Given:

$capstone\ height\ \approx\ 1.8390691329\ meters$

Let:

$a\ \approx\ 1.8390691329$

Then:

$b\ =\ a\ \cdot \sqrt{2}$

$c\ \approx\ 2.0740979055$

$lateral\ sidelength\ \approx\ 2.0740979055\ meters$

$c\ =\sqrt{a^{2}\ +\ c^{2}}$

$d\ =\ 2.7720132390$

$lateral\ slant\ height\ =\ 2.7720132390\ meters$

$f\ =tan^{-1}(a/c)$

$f\ \approx\ 0.7254092153$

$lateral\ angle\ of\ elevation\ \approx\ 0.7254092153\ rads$

$lateral\ angle\ of\ elevation\ \approx\ 41.5628864579\ \circ$

$g\ \approx\ 2\ \cdot\ c$

$g\ \approx\ 2.9332173877$

$total\ outer\ sidelength\ \approx\ 2.9332173877\ meters$

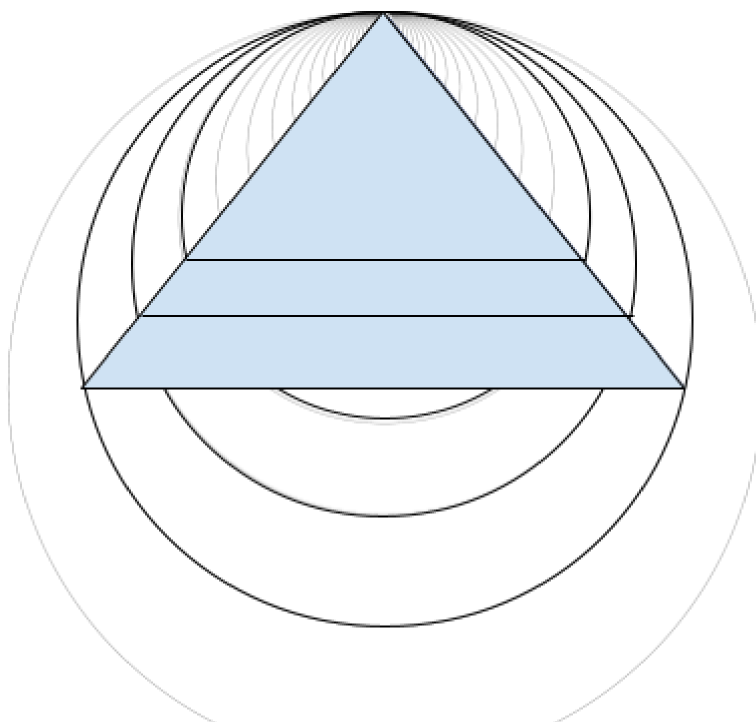
$h\ \approx\ 2\ \cdot\ c$

$h\ \approx\ 4.1481958110$

$total\ lateral\ sidelength\ \approx\ 4.1481958110\ meters$

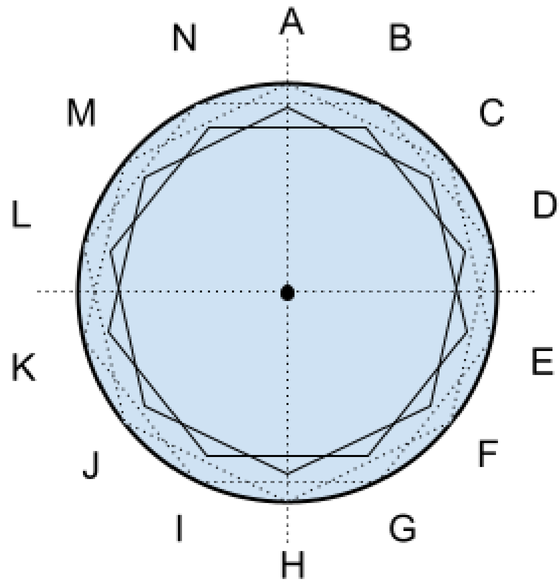
32. Iterations of the Seven Great Circles

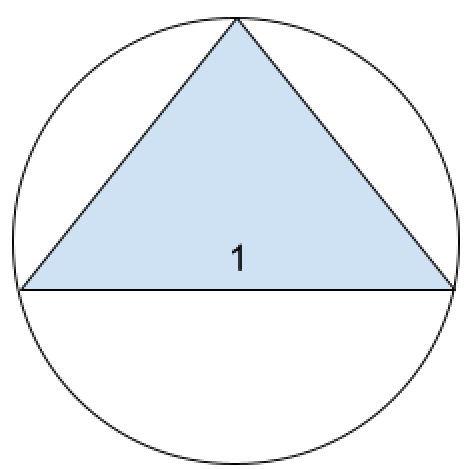
In this section, we delve into the data concerning three iterations of the seven circles of the Great Pyramid, providing detailed calculations to clarify the methodology behind these values. This information is crucial for precisely determining the internal dimensions of different sections within the pyramid. We will refer back to this section as necessary for future calculations in this paper.



Pre Iteration 1

The table below presents the data for the pre iteration of the seven circles of the Pyramid. The radius utilized to derive this information is denoted as ($r = 98.1578283585$), referred to as radius 1.

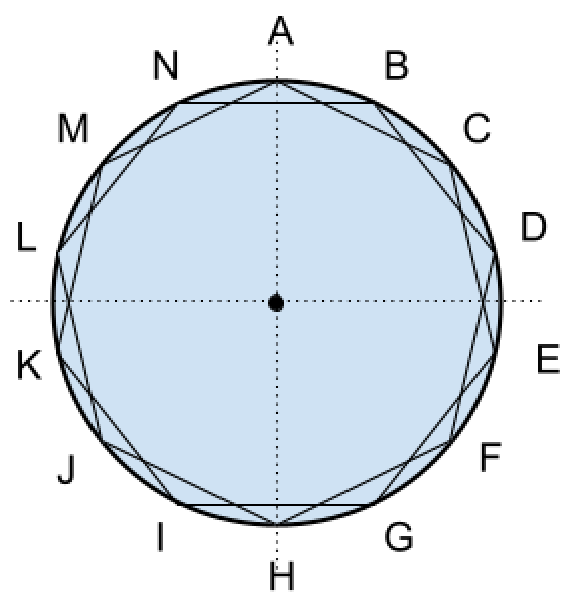


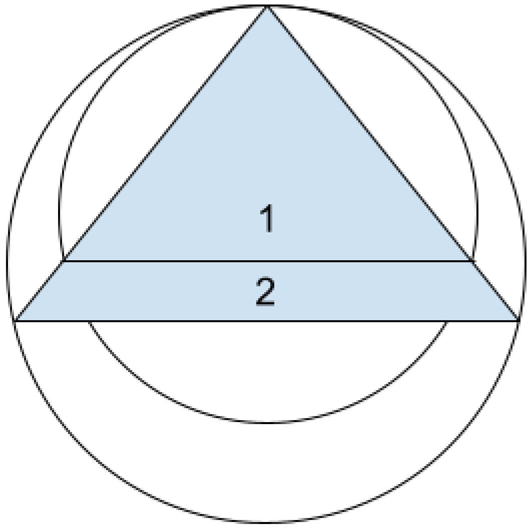


Pre Iteration One	Radius (Meter)	Diameter (Meter)
1	98. 1578283585	196. 3156567171
2	95. 6968066659	191. 3936133318
3	88. 4371474919	176. 8742949839
4	76. 7428804614	153. 4857609228
5	61. 2004049541	122. 4008099083
6	42. 5890855919	85. 1781711837
7	21. 8421716415	43. 6843432829

Iteration 1

The table below presents the data for the first iteration of the seven circles of the Pyramid. The radius utilized to derive this information is denoted as ($r = 120$), referred to as radius 1.

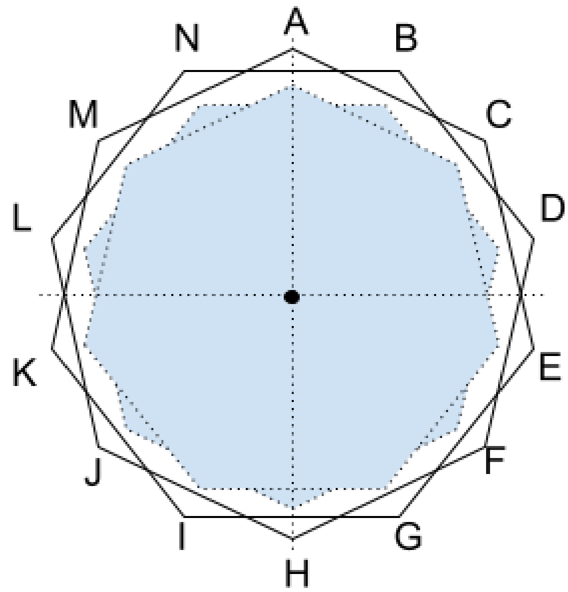


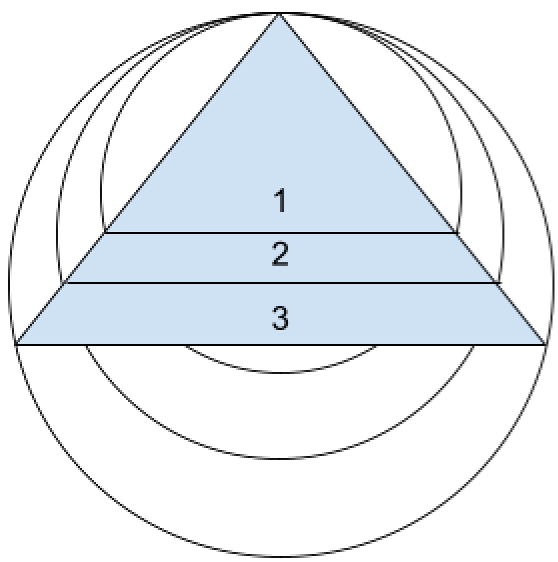


Iteration 1	Radius (Meter)	Diameter (Meter)
1	120	240
2	116.9913494618	233.9826989236
3	108.1162641483	216.2325282966
4	93.8197778962	187.6395557923
5	74.8187762230	149.6375524461
6	52.0660486941	104.1320973882
7	26.7025120748	53.4050241495

Iteration 2

The table below presents the data for the second iteration of the seven circles of the Pyramid. The radius utilized to derive this information is denoted as ($r = 146.7025120748$), referred to as radius 1.



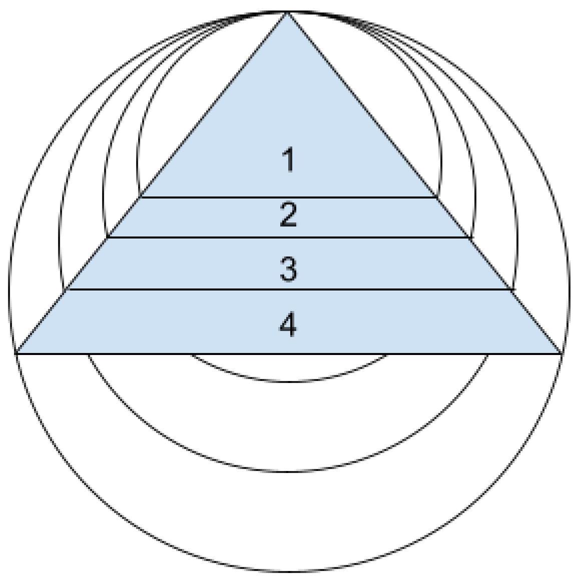


Iteration 2	Radius (Meter)	Diameter (Meter)
1	146. 7025120748	293. 4050241495
2	143. 0243738089	286. 0487476177
3	132. 1743962224	264. 3487924449

4	114. 6966424972	229. 3932849944
5	91. 4675201857	182. 9350403713
6	63. 6518344769	127. 3036689539
7	32. 6443800006	65. 2887600012

Iteration 3

The table below presents the data for the third iteration of the seven circles of the Pyramid. The radius utilized to derive this information is denoted as ($r = 179.3468920754$), referred to as radius 1.

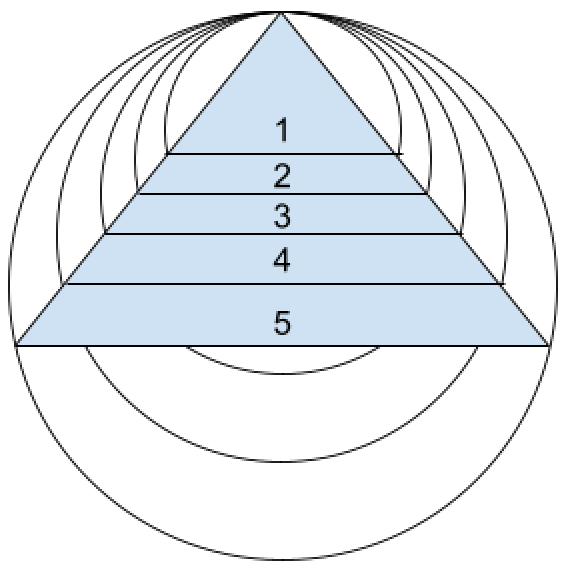


Iteration 3	Radius (Meter)	Diameter (Meter)
1	179. 3468920754	358. 6937841507
2	174. 8502910473	349. 7005820947
3	161. 5859663150	323. 1719326299
4	140. 2190465073	280. 4380930146

5	111. 8209582041	223. 6419164081
6	77. 8157001328	155. 6314002656
7	39. 9084379268	79. 8168758535

Iteration 4

The table below presents the data for the fourth iteration of the seven circles of the Pyramid. The radius utilized to derive this information is denoted as ($r = 219.2553300021$), referred to as radius 1.



Iteration 4	Radius (Meter)	Diameter (Meter)
1	219. 2553300021	438. 5106600043
2	213. 7581411137	427. 51628222758
3	197. 5422264536	395. 0844529072
4	171. 4207196946	342. 8414393892
5	136. 7034622595	273. 4069245190

6	95.1313224028	190.2626448056
7	48.7889008070	97.5778016140

Definition and Calculations:

$great\ ratio = \Lambda = \frac{pyramid\ height}{pyramid\ radius}$

$\Lambda = 1 + sin(\pi/14)$

$\Lambda \approx 1.2225209340$

Radius Formula for the Seven Great Circles:

$Circle = r \times abs(sin\ \theta)$

Radius Formula for the First Iteration:

$r = 120/\Lambda = 120/(1 + sin(\pi/14))$

Radius for the Second Iteration:

$pyramid\ radius = 120$

Radius Formula for the Third Iteration:

$r = 120 \cdot (1 + sin(\pi/14))$

Angular Measurements Utilized in this Section:

Angle Name	Sine	Cosine
$A = \pi/2$	1	0
$B = \pi/14$	0.2225209340	0.9749279122

$C = 5\pi/14$	0.9009688679	0.43388373915
$D = 3\pi/14$	0.6234898019	0.7818314825
$E = 3\pi/14$	0.6234898019	0.7818314825
$F = 23\pi/14$	0.6234898019	0.7818314825
$G = 5\pi/14$	0.9009688679	0.43388373915

Calculations for the Pre Iteration:

$r = 120/\Lambda = 120/(1 + sin(\pi/14)) = 98.1578283585$

$r = 120/(1 + sin(\pi/14))$

$Circle\,1 = 120/(1 + sin(\pi/14)) \cdot sin(\pi/2) = 98.1578283585$

$Circle\,2 = 120/(1 + sin(\pi/14)) \cdot cos(\pi/14) = 95.6968066659$

$Circle\,3 = 120/(1 + sin(\pi/14)) \cdot sin(5\pi/14) = 88.4371474919$

$Circle\,4 = 120/(1 + sin(\pi/14)) \cdot cos(3\pi/14) = 76.7428804614$

$Circle\,5 = 120/(1 + sin(\pi/14)) \cdot sin(3\pi/14) = 61.2004049541$

$Circle\,6 = 120/(1 + sin(\pi/14)) \cdot cos(5\pi/14) = 42.5890855919$

$Circle\,7 = 120/(1 + sin(\pi/14)) \cdot sin(\pi/14) = 21.8421716415$

Calculations for the Iteration 1:

$pyramid\,radius = 120$

$r = 120$

$Circle\,1 = 120 \cdot sin(\pi/2) = 120$

$Circle\,2 = 120 \cdot cos(\pi/14) = 116.9913494619$

$Circle\,3 = 120 \cdot sin(5\pi/14) = 108.1162641483$

$Circle\,4 = 120 \cdot cos(3\pi/14) = 93.8197778962$

$Circle\,5 = 120 \cdot sin(3\pi/14) = 74.8187762230$

$Circle\ 6 = 120 \cdot cos(5\pi/14) = 52.0660486941$

$Circle\ 7 = 120 \cdot sin(\pi/14) = 26.7025120748$

Calculations for the Iteration 2:

$r = 120 \cdot (1 + sin(\pi/14)) = 146.7025120748$

$r = 120 \cdot (1 + sin(\pi/14)))$

$Circle\ 1 = 120 \cdot (1 + sin(\pi/14))) \cdot sin(\pi/2) = 146.7025120748$

$Circle\ 2 = 120 \cdot (1 + sin(\pi/14))) \cdot cos(\pi/14) = 143.0243738089$

$Circle\ 3 = 120 \cdot (1 + sin(\pi/14))) \cdot sin(5\pi/14) = 132.1743962224$

$Circle\ 4 = 120 \cdot (1 + sin(\pi/14))) \cdot cos(3\pi/14) = 114.6966424972$

$Circle\ 5 = 120 \cdot (1 + sin(\pi/14))) \cdot sin(3\pi/14) = 91.4675201857$

$Circle\ 6 = 120 \cdot (1 + sin(\pi/14))) \cdot cos(5\pi/14) = 63.6518344769$

$Circle\ 7 = 120 \cdot (1 + sin(\pi/14))) \cdot sin(\pi/14) = 32.6443800006$

Calculations for the Iteration 3:

$r = 146.7025120748 \cdot (1 + sin(\pi/14)) = 179.3468920754$

$r = 120(1 + sin(\pi/14)) \cdot (1 + sin(\pi/14)) = 179.3468920754$

$r = 120(1 + sin(\pi/14))^2$

$Circle\ 1 = 120(1 + sin(\pi/14))^2 \cdot sin(\pi/2) = 179.3468920754$

$Circle\ 2 = 120(1 + sin(\pi/14))^2 \cdot cos(\pi/14) = 174.8502910473$

$Circle\ 3 = 120(1 + sin(\pi/14))^2 \cdot sin(5\pi/14) = 161.5859663150$

$Circle\ 4 = 120(1 + sin(\pi/14))^2 \cdot cos(3\pi/14) = 140.2190465073$

$Circle\ 5 = 120(1 + sin(\pi/14))^2 \cdot sin(3\pi/14) = 111.8209582041$

$Circle\ 6 = 120(1 + sin(\pi/14))^2 \cdot cos(5\pi/14) = 77.8157001328$

$Circle\ 7 = 120(1 + sin(\pi/14))^2 \cdot sin(\pi/14) = 39.9084379268$

Calculations for the Iteration 4:

$r = 179.3468920754 \cdot (1 + sin(\pi/14)) = 219.2553300021$

$r = 120 \cdot (1 + sin(\pi/14))^2 \cdot (1 + sin(\pi/14)) = 219.2553300021$

$r = 120 \cdot (1 + sin(\pi/14))^3$

$Circle\ 1 = 120 \cdot (1 + sin(\pi/14))^3 \cdot sin(\pi/2) = 219.2553300021$

$Circle\ 2 = 120 \cdot (1 + sin(\pi/14))^3 \cdot cos(\pi/14) = 213.7581411137$

$Circle\ 3 = 120 \cdot (1 + sin(\pi/14))^3 \cdot sin(5\pi/14) = 197.5422264536$

$Circle\ 4 = 120 \cdot (1 + sin(\pi/14))^3 \cdot cos(3\pi/14) = 171.4207196946$

$Circle\ 5 = 120 \cdot (1 + sin(\pi/14))^3 \cdot sin(3\pi/14) = 136.7034622595$

$Circle\ 6 = 120 \cdot (1 + sin(\pi/14))^3 \cdot cos(5\pi/14) = 95.1313224028$

$Circle\ 7 = 120(1 + sin(\pi/14))^3 \cdot sin(\pi/14) = 48.7889008070$

33. Dimensions of the Passageways

In this section, we unveil the methodology used to determine the dimensions of the passageways within the Great Pyramid of Egypt. To accomplish this, we draw upon insights from the preceding section, with a particular focus on Circle 7, representing the third iteration of the seven great circles. It's important to note that the term 'perpendicular height' refers to the vertical distance from the bottom to the top of either the descending or ascending passageway.

Descending and Ascending Passageways:

Dimensions	Meters	Feet
Width	1. 0744855636	3. 5252151037
Perpendicular Height	1. 0744855636	3. 5252151037
Vertical height	1. 1925890027	3. 9126935783
Hidden side	0. 5174449757	1. 6976541198

Queen's Passageway:

Dimensions	Meters	Feet
Width	1. 0744855636	3. 5252151037
Height	1. 1925890027	3. 9126935783
Hidden side	0. 5174449757	1. 6976541198
Antichamber height	1. 7100339784	5. 6103476981

Grand Gallery:

Dimensions	Meters	Feet
Width	2.1489711272	7.0504302075
Height	8.5958845089	28.2017208299
East Ledge Width	0.5372427818	1.7626075519
West Ledge Width	0.5372427818	1.7626075519
Corridor Width	1.0744855636	3.5252151037
Corbel starting level	2.2947069646	7.5285661569
Corbel Width	0.0767489688	0.2518010788

Definition and Calculations:

The calculations for the dimensions of the passageways are provided below.

Third Iteration, Circle 7:

Circle	Radius	Diameter
7	32.6443800006	65.2887600012

Angle At The Point N:

Radians	Sine	Cosine
$N = 9\pi/14$	0.9009688679	-0.4338837391

Descending and Ascending Passageways:

Width and Height:

$a = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$a \approx 1.0744855636\, m$

Vertical Height:

$c = a / cos(\pi/7)$

$c \approx 1.1925890027\, m$

Hidden Side: (The Cubit)

$b = a \cdot tan(\pi/7)$

$b \approx 0.5174449757$

Second Iteration of the tetradecagon:

Calculations for the Center Point of the King's Chamber Design:

$r = r1 \cdot sin(\pi/14)$

$r = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14)$

$r = 32.6443800006\, m$

Value of x:

$x = r \cdot sin(9\pi/14)$

$x = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot (sin(9\pi/14))$

$x = 29.4115700925$

Value of x (2nd formula):

$x = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot (sin(5\pi/14))$

Value of y:

$y = r \cdot cos(9\pi/14)$

$y = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot cos(9\pi/14)$

$y = -14.1638656558$

Value of y (2nd formula):

$y = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot cos(5\pi/14)$

$y = 14.1638656558$

Center of the King's Chamber Design:

$Center\ point = (29.4115700925, -14.1638656558)$

Calculations for the Radius 1 of the King's Chamber Design:

$r = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14)$

$r1 = r/2$

$r1 = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14)/2$

$r1 = 60 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14)$

$r1 = 16.3221900003$

Calculations for the Radius 2 of the King's Chamber Design:

$y = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot cos(9\pi/14)$

$r2 = abs\ (y)$

$r2 = abs(-14.1638656558)$

$r2 = 14.1638656558$

$x = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot (sin(9\pi/14))$

$x = 29.4115700925$

Calculations for the Radius 2 of the King's Chamber Design:

$y = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot cos(5\pi/14)$

$r2 = 14.1638656558$

$x = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot (sin(5\pi/14))$

$x = 29.4115700925$

Queen's Chamber Design Radius:

$Qr = x - r1$

$x = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot (sin(9\pi/14))$

$r1 = 60 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14)$

$Qr = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot (sin(9\pi/14)) - 60 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14)$

$Qr = 60 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot (2 \cdot sin(9\pi/14) - 1)$

$Qr = 13.0893800922$

Queen's Chamber Design Radius (2nd formula):

$Qr = x - r1$

$x = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot (sin(5\pi/14))$

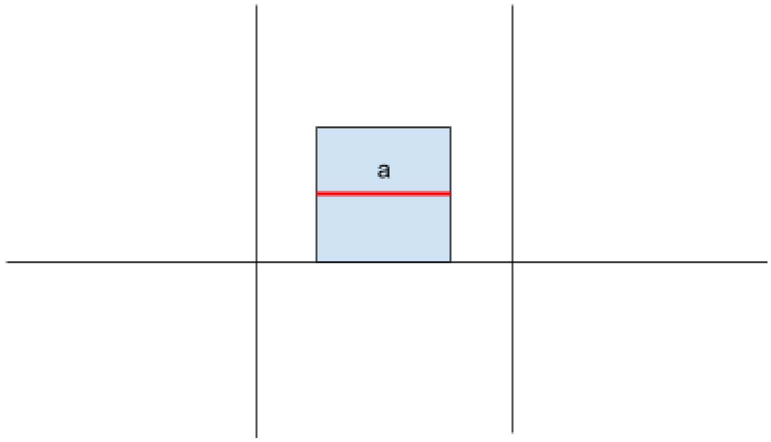
$r1 = 60 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14)$

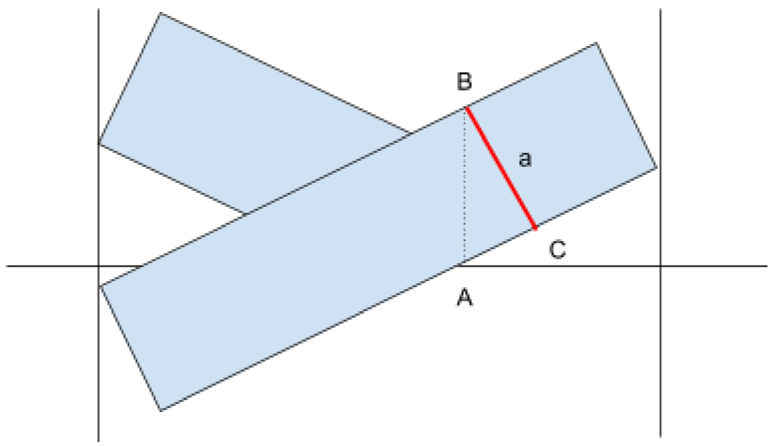
$Qr = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot (sin(5\pi/14)) - 60 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14)$

$Qr = 60 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot (2 \cdot sin(5\pi/14) - 1)$

$Qr = 13.0893800922$

Width of the passageways is the same as the perpendicular height:





King's chamber design radius:

$y = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot cos(5\pi/14)$

$y = 14.1638656558$

$r2 = y$

$r2 = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot cos(5\pi/14)$

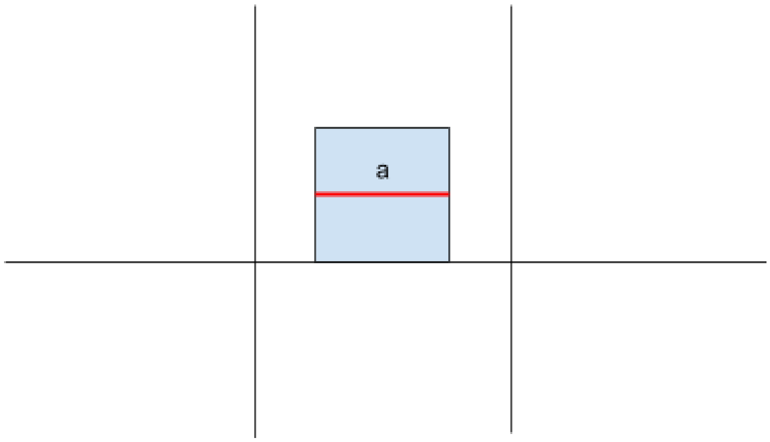
$r2 = 14.1638656558$

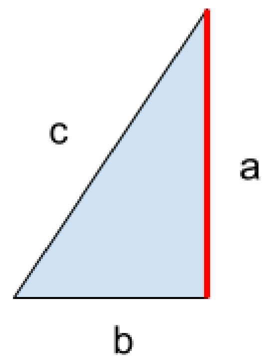
Queen's chamber design radius:

$Qr = 60 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot (2 \cdot sin(5\pi/14) - 1)$

$Qr = 13.0893800922$

Difference of two design radii is the width of the passageways:





$a = r2 - Qr$

$r2 = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot cos(5\pi/14)$

$Qr = 60 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot (2 \cdot sin(5\pi/14) - 1)$

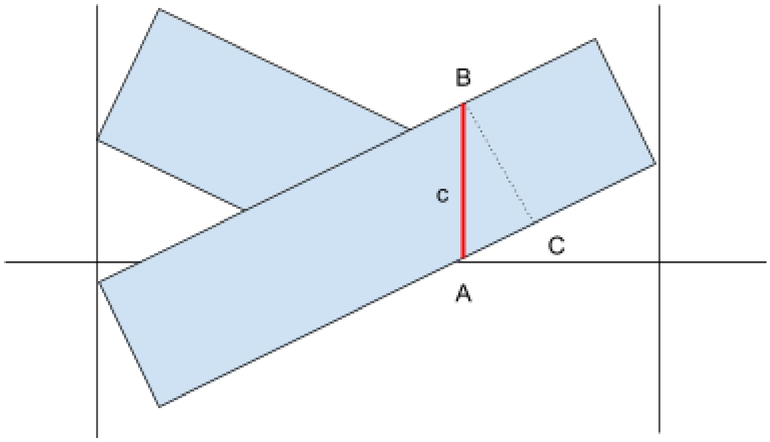
$a = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot cos(5\pi/14)$

$- 60 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot (2 \cdot sin(5\pi/14) - 1)$

$a = 120 \cdot (sin(\pi/14) + sin^2 \pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$a \approx r2 - Qr = 14.1638656558 - 13.0893800922 \approx 1.0744855636\, m$

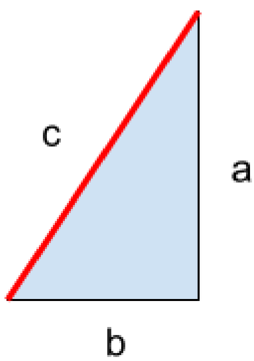
Vertical Height of the passageways:



Angle of the Passageways:
$A = \pi/7$

let:

$a = opposite\ side$ $b = Adjacent\ side$ $c = Hypotenuse$



$a = 1.0744855636$ $b = Adjacent\ side$ $c = Hypotenuse$ $A = \pi/7$

$a = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$b = a \cdot tan(\pi/7)$

$c = a / cos(\pi/7)$

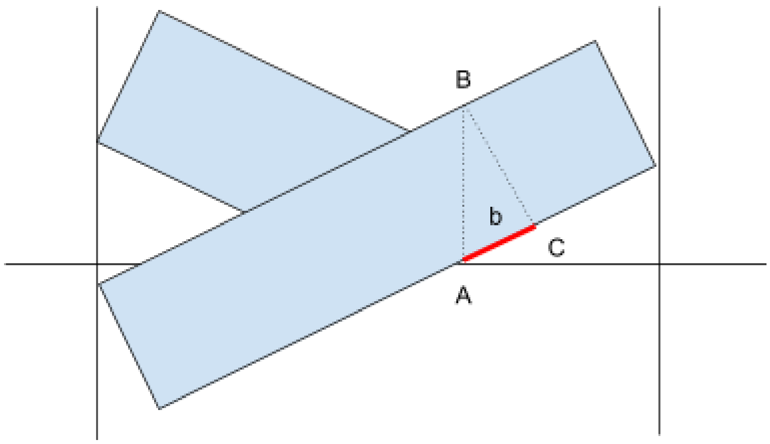
$a \approx 1.0744855636\, m$

$c = a / cos(\pi/7)$

$c \ = \frac{120}{cos(\pi/7} \cdot (sin(\pi/14) \ + sin^2\pi/14)) \ \cdot \ (cos(5\pi/14) \ - \ sin(5\pi/14) \ + \ 1/2)$

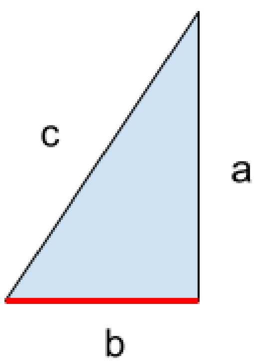
$c \ \approx \ 1.1925890027 \, m$

Hidden side of the passageways (The egyptian cubit):



let:

$a \ = \ opposite \ side \qquad b \ = \ Adjacent \ side \qquad c \ = \ Hypotenuse$



$a \ = \ 1.0744855636 \qquad b \ = \ Adjacent \ side \qquad c \ = \ Hypotenuse \qquad A \ = \ \pi/7$

$b \ = \ a \ \cdot \ tan(\pi/7)$

$a \ = \ 120 \ \cdot \ (sin(\pi/14) \ + sin^2\pi/14)) \ \cdot \ (cos(5\pi/14) \ - \ sin(5\pi/14) \ + \ 1/2)$

$a \ \approx \ 1.0744855636 \, m$

$b \ = \ a \ \cdot \ tan(\pi/7)$

$b = 120 \cdot tan(\pi/7) \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$b \approx 0.5174449757\, m$

Width of the Grand Gallery

$w1 = 2 \cdot a$

$a = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$a = r2 - Qr \approx 14.1638656558 - 13.0893800922 \approx 1.0744855636\, m$

$w1 \approx 2 \cdot a$

$w1 = 2 \cdot 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$w1 = 240 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$w1 \approx 2 \cdot 1.0744855636$

$w1 \approx 2.1489711272\, m$

Height of the Grand Gallery

$h1 = 4 \cdot w1$

$h1 = 4 \cdot 240 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$h1 = 8 \cdot 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$h1 = 960 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$h1 = 4 \cdot 2.1489711272 \approx 8.5958845089$

$h1 \approx 8.5958845089\, m$

Simple calculation of the Dimensions of the Descending and Ascending Passageways:

$width \approx 1.0744855636$

$Perpendicular\ Height \approx 1.0744855636$

$Vertical\ Height \approx 1.1925890027$

$Hidden\ side \approx 0.5174449757\ m$

Simple calculation of the Dimensions of the Queen's Passageways:

$width \approx 1.0744855636$

$Height \approx 1.1925890027$

$Hidden\ side \approx 0.5196971117$

$AntiChamber\ Height = Vertical\ Height + Hidden\ side$

$AntiChamber\ Height \approx 1.1925890027 + 0.5174449757 \approx 1.7100339784$

angle:

$angle = \pi/7$

$a = 2\pi/7$

$b = (\pi - 2\pi/7) / 2$

$b = 5\pi/14$

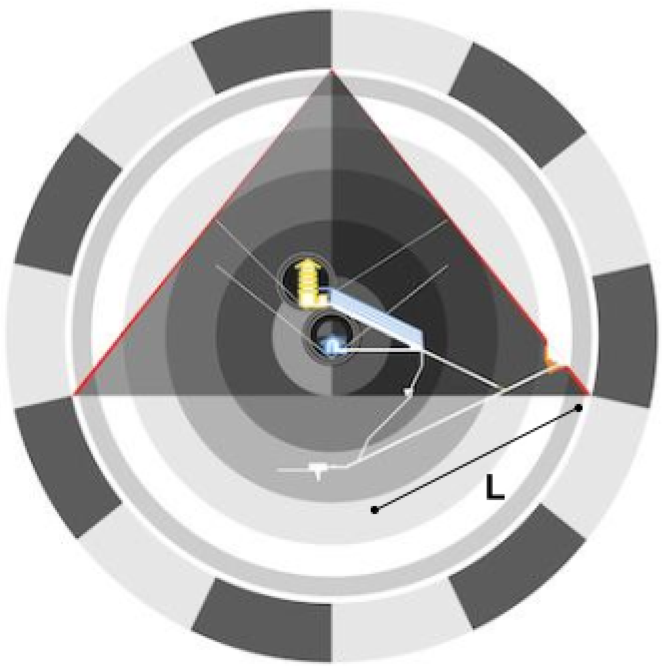
$e = \pi/2 - 5\pi/14$

$e = \pi/7$

$e = angle = \pi/7$

34. Descending Passageway

The descending passageway, the longest in the pyramid, extends to 106 meters—longer than two Olympic swimming pools combined. In this chapter, we will reveal how to derive these elusive and hidden measurements of the Great Pyramid.



Descending Passageway:

Dimensions	Meters	Feet
Height (y)	45. 9956360380	150. 9043177099
Length (x)	95. 5109223818	313. 3560445599
Hypotenuse (h)	106. 0091261579	347. 7989703344
Distance off front center	6. 6756280187	21. 9016667280

Angles:

Diagonal	Radian	Radian	Degree
Angle A	$\pi/7$	0.4487989505	25.7142857143
Angle B	$5\pi/14$	1.1219973763	64.2857142857
Angle C	$\pi/2$	1.5707963268	90

Definition and Calculations:

The calculations for the dimensions of the passageways are provided below.

Radius 7: First Iteration

$$a = 120 \cdot sin(\pi/14)$$

$$a = radius\ 7 \approx 26.7025120748\ meters$$

Chamber Design Radius:

$$b = a / 2$$

$$b \approx 13.3512560374\ meters$$

Chamber Design Radius:

$$d = b / 2$$

$$b \approx 6.6756280187\ meters$$

Radius 7: Second Iteration

$$c = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14)$$

$$c = 32.6443800006\ meters$$

Angle of the Descending Passageway:

$A = \pi/7$

Descending Passageway Triangle: the height value

$y = a + c - b$

$y = 120 \cdot sin(\pi/14) + 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) - 120 \cdot sin(\pi/14)/2$

$y = 180 \cdot sin(\pi/14) + 120 \cdot (sin(\pi/14))^2$

$y = 45.9956360380$

Descending Passageway Triangle hypotenuse: the length

$h = y / sin(\pi/7)$

$h = (180 \cdot sin(\pi/14) + 120 \cdot (sin(\pi/14))^2) / sin(\pi/7)$

$h = 106.0091261579\ meters$

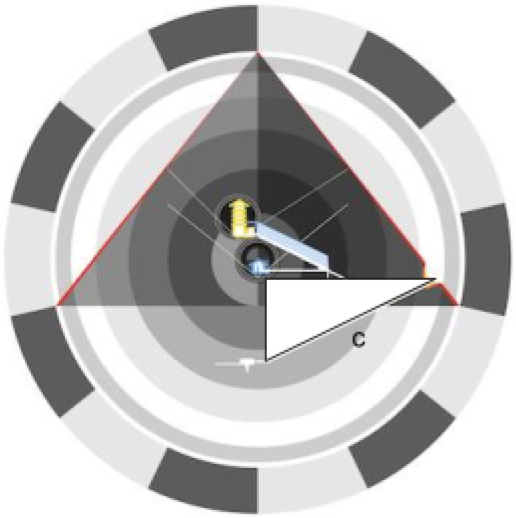
Descending Passageway Triangle: the horizontal value

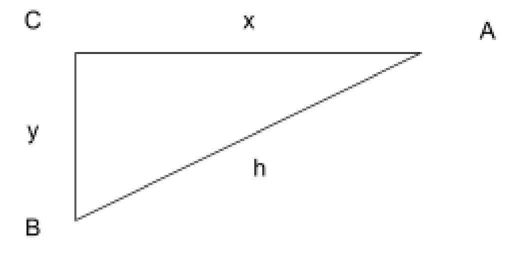
$x = y / tan(\pi/7)$

$x = (180 \cdot sin(\pi/14) + 120 \cdot (sin(\pi/14))^2) / tan(\pi/7)$

$x = 95.5109223818\ meters$

Descending Passageway Triangle:





$A = \pi/7$ $B = 5\pi/14$ $C = \pi/2$

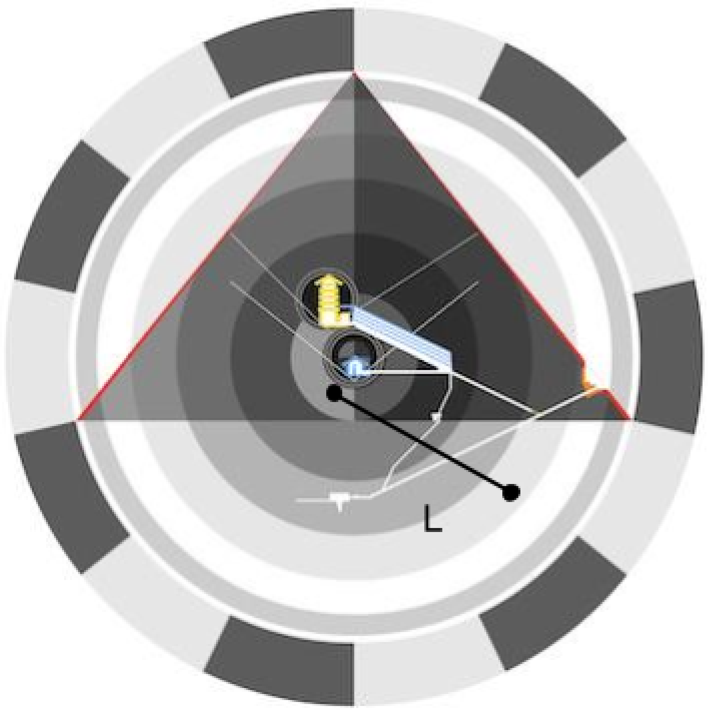
$y = 45.9956360380\ meters$

$x = 95.5109223818\ meters$

$h = 106.0091261579\ meters$

35. Distance to the Great Step

The distance to the Great Step, the second longest in the pyramid, extends from the center of the descending passageway all the way up to the center of the pyramid, about 21 inches over the Great Step. It includes both the lengths of the ascending passageway and Grand Gallery.



Distance to the Great Step:

Dimensions	Meters	Feet
Height (y)	37. 6309379726	123. 4610825872
Length (x)	78. 1414478731	256. 3695796363
Hypotenuse (h)	86. 7304639006	284. 5487660780

Interaction point:

This refers to the point where the ascending and descending passageways intersect, situated at the midpoint of both passageways.

Dimensions	Meters	Feet
Height (y)	2. 4228301396	7. 9489177807
Length (x)	78. 1414478731	256. 3695796363

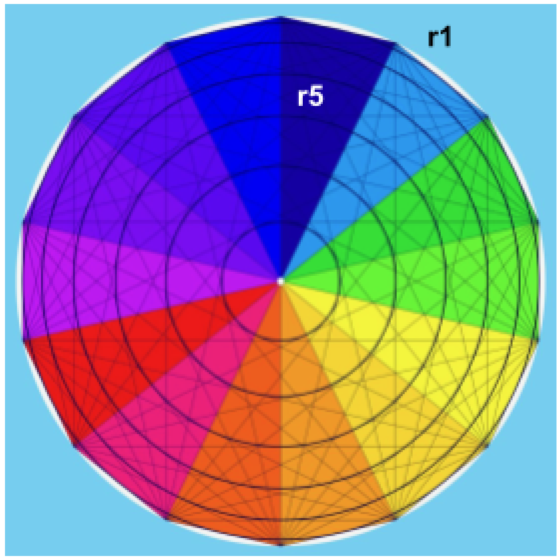
Angles:

Diagonal	Radian	Radian	Degree
Angle A	π/7	0. 4487989505	25. 7142857143
Angle B	5π/14	1. 1219973763	64. 2857142857
Angle C	π/2	1. 5707963268	90

Definition and Calculations:

The calculations for the dimensions of the passageways are provided below.

Radius 1 & 5: Fourth Iteration



$Circle\, r1 = 120 \cdot (1 + sin\, \pi/14) \cdot sin(\pi/2) = 146.7025120748$

$Circle\, r1 = 120 \cdot (1 + sin\, \pi/14)) = 146.7025120748$

$Circle\, r5 = 120 \cdot (1 + sin\, \pi/14) \cdot sin(5\pi/14) = 91.4675201857$

The Difference of Radiuses 1 & 5: Fourth Iteration

$Difference = Circle\, r1 - Circle\, r5$

$D = 120 \cdot (1 + sin\, \pi/14) \cdot (1 + sin(3\pi/14))$

$D = 55.2349918891\, meters$

Chamber Design Radius:

$a = chamber\, radius = 120 \cdot (sin\, \pi/14) \approx 26.7025120748\, meters$

$b = Chamber\, design\, radius = chamber\, radius\, /\, 2$

$b = a\, /\, 2 = 60 \cdot (sin\, \pi/14) \approx 13.3512560374\, meters$

$c = b/2 = 30 \cdot (sin\, \pi/14) \approx 6.6756280187\, meters$

Vertical Distance:

$v = D + b + c$

$v \approx 55.2349918891 + 13.3512560374 + 6.6756280187$

$v \approx 75.2618759452 \; meters$

Great Step Triangle:

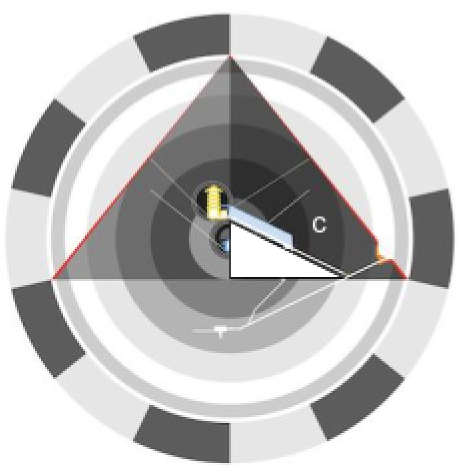
$y = v/2$

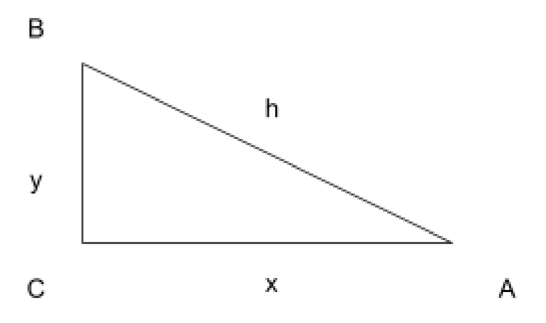
$y = 75.2618759452/2 \approx 37.6309379726 \; meters$

$x = y \,/\, tan\, \pi/7 \approx 78.1414478731 \; meters$

$h = \sqrt{x^2 + y^2} \approx 86.7304639006 \; meters$

Triangle:





$A = \pi/7$ $\quad B = 5\pi/14$ $\quad C = \pi/2$

$y = 37.6309379726 \; meters$

$x = 78.1414478731 \; meters$

$h = 86.7304639006 \; meters$

Intersection point: Ix

$y = 37.6309379726\, meters$

$x = 78.1414478731\, meters$

$lx = x = 78.1414478731\, meters$

Intersection point height: Iy

$a = chamber\, radius = 120 \cdot (sin\, \pi/14) \approx 26.7025120748\, meters$

$b = a\, /\, 2 = 60 \cdot (sin\, \pi/14) \approx 13.3512560374\, meters$

$f = a + b$

$f = 120 \cdot (sin\, \pi/14) + 60 \cdot (sin\, \pi/14)$

$f = 40.0537681121$

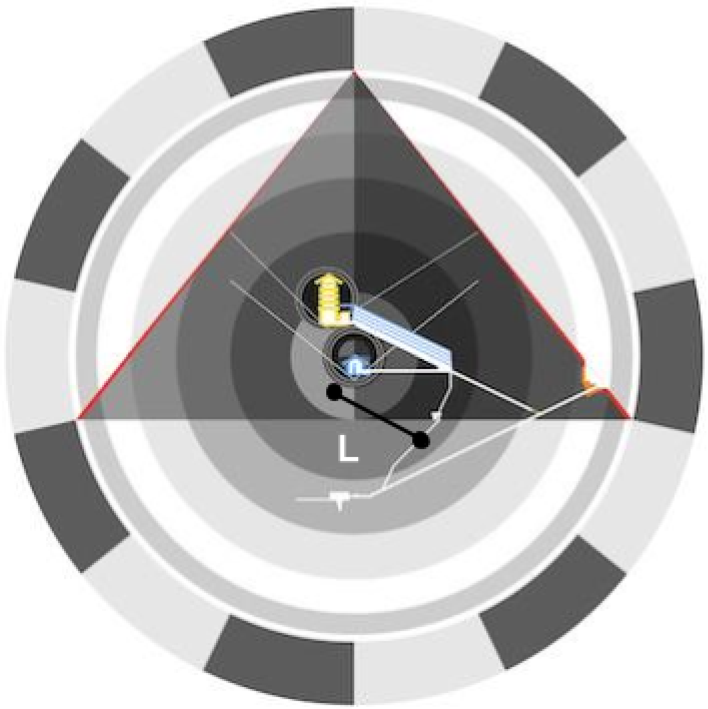
$Iy = f - y$

$Iy = 40.0537681121 - 37.6309379726$

$Iy = 2.4228301396\, meters$

36. The Grand Gallery & Ascending Passageway

With the distance to the Great Step established in the previous chapter, we can now divide it into two sections: the portion from the Grand Gallery to the top of the Great Step, and the ascending passageway.



Descending Passageway:

Dimensions	Meters	Feet
Height (y)	17.6040539165	57.7560824032
Length (x)	36.5551946240	119.9317408925
Hypotenuse (h)	40.5732050533	133.1141898074

Grand Gallery:

Dimensions	Meters	Feet
Height (y)	20. 0268840561	65. 7050001840
Length (x)	41. 5862532491	136. 4378387438
Hypotenuse (h)	46. 1572588473	151. 4345762706

Distance to the Great Step:

Dimensions	Meters	Feet
Height (y)	37. 6309379726	123. 4610825872
Length (x)	78. 1414478731	256. 3695796363
Hypotenuse (h)	86. 7304639006	284. 5487660780

Angles:

Diagonal	Radian	Radian	Degree
Angle A	$\pi/7$	0. 4487989505	25. 7142857143
Angle B	$5\pi/14$	1. 1219973763	64. 2857142857
Angle C	$\pi/2$	1. 5707963268	90

Definition and Calculations:

The calculations for the dimensions of the passageways are provided below.

Chamber Design Radius:

$a = chamber\ radius = 120 \cdot (sin\ \pi/14) \approx 26.7025120748\ meters$

$b = 60 \cdot (sin\ \pi/14) \approx 13.3512560374\ meters$

$c = 30 \cdot (\sin \pi/14) \approx 6.6756280187\ meters$

Grand Gallery Vertical Distance:

$y = b + c$

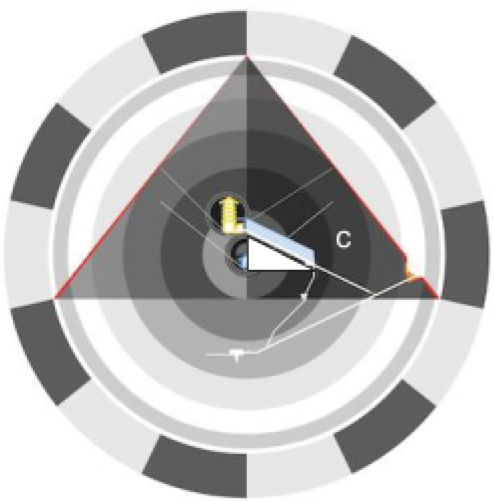
$y = 60 \cdot (\sin \pi/14) + 30 \cdot (\sin \pi/14)$

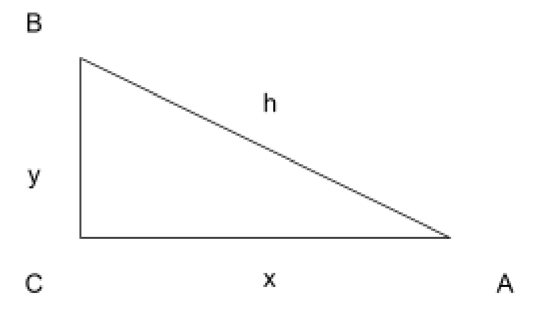
$y = 90 \cdot (\sin \pi/14)$

$y \approx 13.3512560374 + 6.6756280187$

$y \approx 20.0268840561\ meters$

Grand Gallery Triangle:





$A = \pi/7$ $B = 5\pi/14$ $C = \pi/2$

$y = 90 \cdot (\sin \pi/14) = 20.0268840561\ meters$

$x = a / \tan \pi/7$

$x = 90 \cdot (\sin \pi/14) / \tan \pi/7 = 41.5862532491\ meters$

$h = \sqrt{x^2 + y^2} = 46.1572588473\ meters$

Great Step Vertical Distance:

$v = D + b + c$

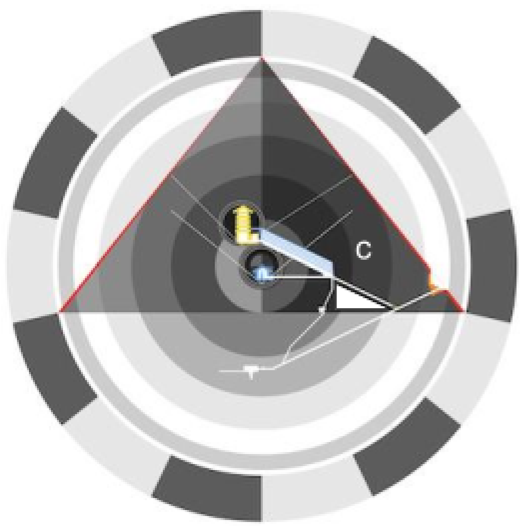
$v = 55.2349918891 + 13.3512560374 + 6.6756280187$

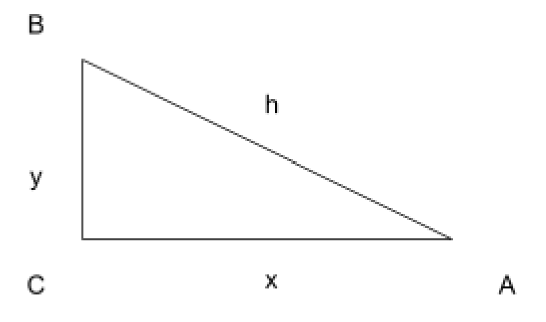
$v = 75.2618759452\ meters$

$D = v/2$

$D = 75.2618759452/2 = 37.6309379726\ meters$

Ascending Passageway Vertical Distance:





$A = \pi/7$ $\quad B = 5\pi/14$ $\quad C = \pi/2$

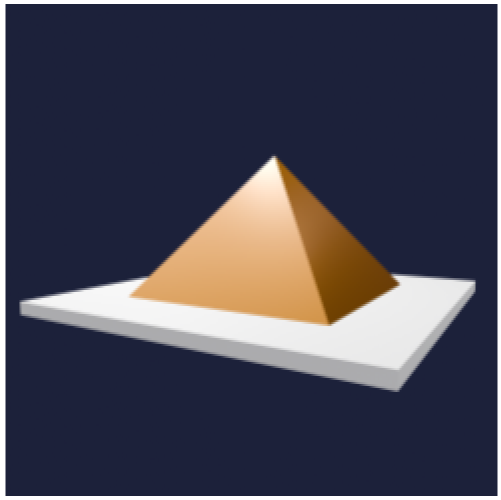
$y = D - b - c$

$y = 17.6040539165\ meters$

$x = a\ /\ tan\ \pi/7 = 36.5551946240\ meters$

$h = \sqrt{x^2 + y^2} = 40.5732050533\ meters$

37. Second Pyramid Dimensions



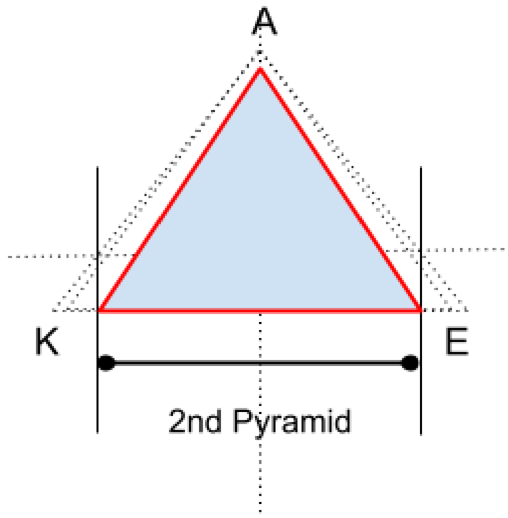
At this point in our investigation, we have gathered enough information to calculate the dimensions of the Second Pyramid of Egypt.

Dimensions	Meters	Feet
Height	143.6938615366	471.4365535977
Sidelength	108.116264148	354.7121527175
Width	216.2325282966	709.4243054350
Diagonal Sidelength	152.8994870716	501.6387371116
Total Dia. Sidelength	305.7989741432	1,003.2774742233
Slant height	179.8250605913	589.9772329112
Diagonal Slant height	209.8241620740	688.3994818701

Outer side angle A			
Angle	**Radian**	**Radian**	**Degree**
A	$tan^{-1}(\frac{sin(\pi/14)+cos(\pi/14)}{sin(5\pi/14)})$	0.9257565309	53.0419420758
B	$tan^{-1}(\frac{sin(5\pi/14)}{sin(\pi/14)+cos(\pi/14))})$	0.6450397959	36.9580579242
C	$\pi/2$	1.5707963268	90
Diagonal side angle A			
A	$tan^{-1}(\frac{sin(\pi/14)+cos(\pi/14)}{\sqrt{2}\cdot sin(5\pi/14)})$	0.7543702553	43.2222318185
B	$tan^{-1}(\frac{\sqrt{2}\cdot sin(5\pi/14)}{sin(\pi/14)+cos(\pi/14)})$	0.8164260715	46.7777681815
C	$\pi/2$	1.5707963268	90

Second Pyramid Angle of Elevation:

The angle of elevation is measured from ground level, specifically from the base's north side of the pyramid. This measurement can be taken from four distinct points: the north, south, east, or west.



$\theta = tan^{-1}((sin(\pi/14) + cos(\pi/14)) / sin(5\pi/14)) = 0.9257565309$

Three ways to get the Angle A, the angle of Elevation:

$$\theta = tan^{-1}(\frac{sin(\pi/14)+cos(\pi/14)}{sin(5\pi/14)})$$

$$\theta = sin^{-1}(\frac{sin(\pi/14)+cos(\pi/14)}{\sqrt{1+sin(\pi/7)+(sin(5\pi/14))^2}})$$

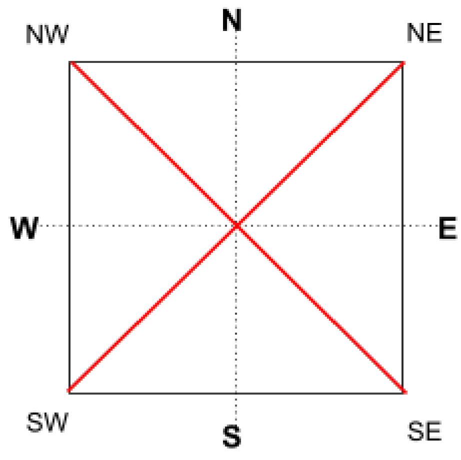
$$\theta = cos^{-1}(\frac{sin(5\pi/14)}{\sqrt{1+sin(\pi/7)+(sin(5\pi/14))^2}})$$

Complementary Angle B:

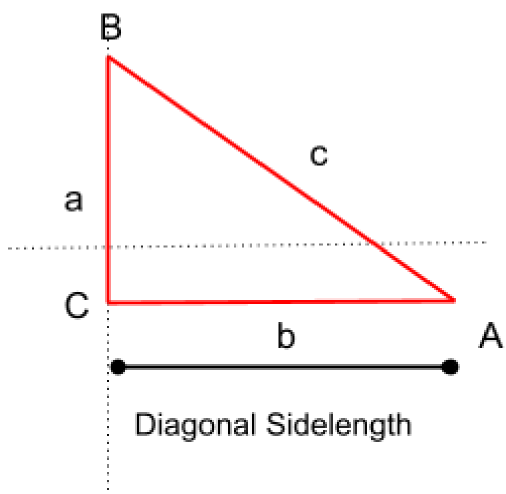
$$\theta = tan^{-1}(\frac{sin(5\pi/14)}{sin(\pi/14)+cos(\pi/14))})$$

Second Pyramid Diagonal Angle of Elevation:

The diagonal angle of elevation is likewise measured from ground level, specifically from the base's northeast side of the pyramid. This measurement can be taken from four distinct points: the northeast, southeast, southwest, or northwest.



Diagonal Measures



Diagonal Sidelength

$\theta\ = tan^{-1}((sin(\pi/14)\ +\ cos(\pi/14))\ /\ \sqrt{2}\cdot\ sin(5\pi/14))\ =\ 0.7543702553$

Three ways to get the Angle A, the diagonal angle of Elevation:

$$\theta\ = tan^{-1}(\frac{sin(\pi/14)+cos(\pi/14)}{\sqrt{2}\cdot sin(5\pi/14)})$$

$$\theta\ = sin^{-1}(\frac{sin(\pi/14)+cos(\pi/14)}{\sqrt{1+sin(\pi/7)+2\cdot(sin(5\pi/14))^2}})$$

$$\theta = cos^{-1}(\frac{\sqrt{2} \cdot sin(5\pi/14)}{\sqrt{1+sin(\pi/7)+2 \cdot (sin(5\pi/14))^2}})$$

Complementary diagonal Angle B:

$$\theta = tan^{-1}(\frac{\sqrt{2} \cdot sin(5\pi/14)}{sin(\pi/14)+cos(\pi/14)})$$

Definition and Calculations:

The dimensions of a secondary pyramid that accompanies the Great Pyramid, at any scale, can be calculated using the provided formulas below.

$a = great\ pyramid\ height$

$b = great\ pyramid\ radius$

$c = capstone\ diameter$

$angle\ B = 5\pi/14$

$d = height$

$d = a - c$

Given:

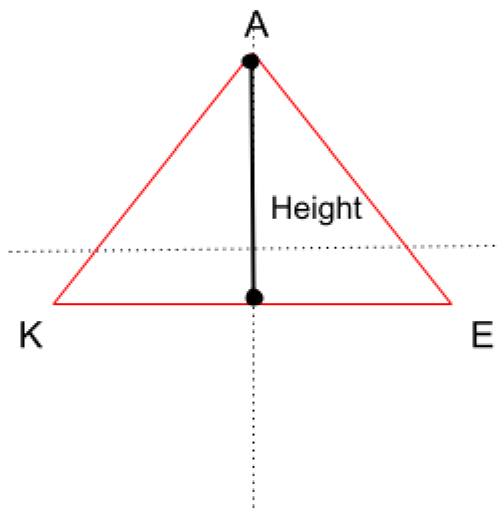
$a = great\ pyramid\ height \approx 146.7025120748\ meters$

$b = great\ pyramid\ radius \approx 120\ meters$

$c = capstone\ diameter \approx 3.0086505382\ meters$

$angle\ B = 5\pi/14$

Height:



$d = a - c$

$d = height$

$a = great\,pyramid\,height \approx 146.7025120748\,meters$

$c = capstone\,diameter \approx 3.0086505382\,meters$

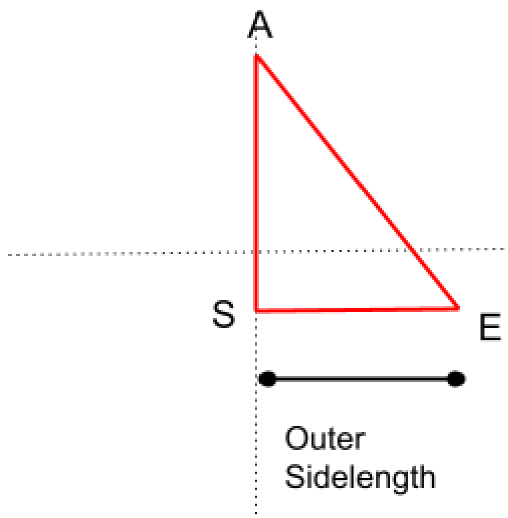
$d = a - c$

$d \approx 143.6938615366$

$d = height \approx 143.6938615366\,meters$

$d = height \approx 471.4365535977\,feet$

Sidelength:



$e = b \times sin(5\pi/14)$

$e = sidelength$

$b = great\,pyramid\,radius \approx 120\,meters$

$angle\,B = 5\pi/14$

$e = b \cdot sin(5\pi/14)$

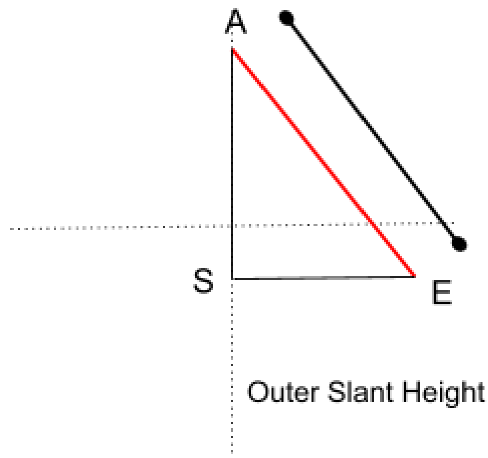
$e = 120 \cdot sin(5\pi/14)$

$e \approx 108.1162641483$

$e = sidelength \approx 108.1162641483\,meters$

$e = sidelength \approx 354.7121527175\,feet$

Slant height:



$f = \sqrt{d^2 + e^2}$

$f = slant\ height$

$d = height \approx 143.6938615366\ meters$

$e = sidelength \approx 108.1162641483\ meters$

$f = \sqrt{d^2 + e^2}$

$f \approx 179.8250605913$

$f = slant\ height \approx 179.8250605913\ meters$

$f = slant\ height \approx 589.9772329112\ feet$

Angle of elevation:

$g = tan^{-1}(d/e)$

$g = angle\ of\ elevation$

$d = height \approx 143.6938615366\ meters$

$e = sidelength \approx 108.1162641483\ meters$

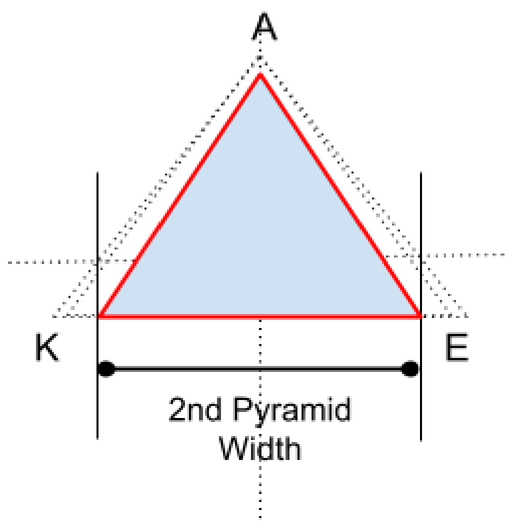
$g = tan^{-1}(d/e)$

$g \approx 0.9257565309$

$g = angle\ of\ elevation \approx 0.9257565309\ rads$

$g = angle\ of\ elevation \approx 53.0419420758^{\circ}$

Width:



$h = 2 \times e$

$h = width$

$e = sidelength \approx 108.1162641483\ meters$

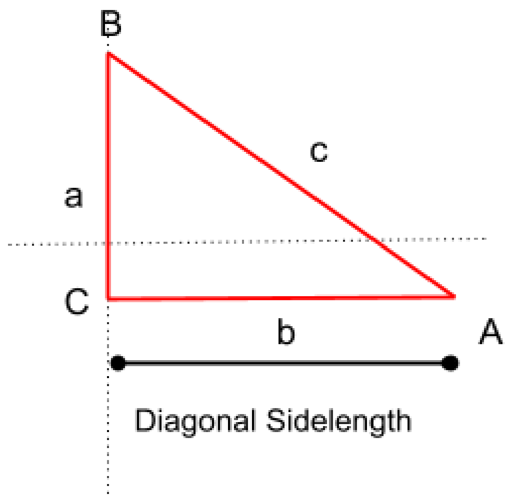
$h = 2 \times e$

$h \approx 216.2325282966$

$h = width \approx 216.2325282966\ meters$

$h = width \approx 709.4243054350\ feet$

Diagonal sidelength of the base:



$i = e \cdot \sqrt{2}$

$i = lateral\ sidelength$

$e = sidelength \approx 108.1162641483\ meters$

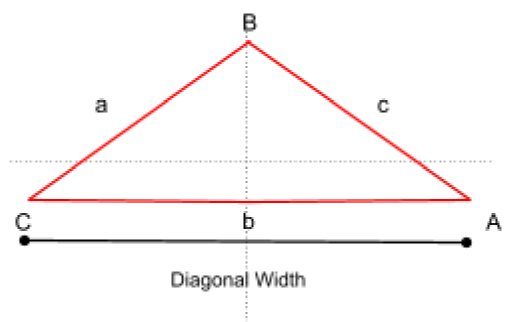
$i = e \cdot \sqrt{2}$

$i \approx 152.8994870716$

$i = lateral\ sidelength \approx 152.8994870716\ meters$

$i = lateral\ sidelength \approx 501.6387371116\ feet$

Diagonal width:



$j = 2 \cdot i$

$j = lateral\ width$

$i = lateral\ sidelength \approx 108.1162641483\ meters$

$j = 2 \cdot i$

$j \approx 305.7989741432$

$j = lateral\ width \approx 305.7989741432\ meters$

$j = lateral\ width \approx 1,003.2774742233\ feet$

Diagonal slant height:

$k = \sqrt{d^2 + i^2}$

$k = lateral\ slant\ height$

$d = height \approx 143.6938615366\ meters$

$i = lateral\ sidelength \approx 152.8994870716\ meters$

$k = \sqrt{d^2 + i^2}$

$k \approx 209.8241620740$

$k = lateral\ slant\ height \approx 209.8241620740\ meters$

$k = lateral\ slant\ height \approx 688.3994818701\ feet$

Base Angle of elevation:

$l = tan^{-1}(d/i)$

$l = angle\ of\ elevation$

$d = height \approx 143.6938615366\ meters$

$i = lateral\ sidelength \approx 152.8994870716\ meters$

$l = tan^{-1}(d/i)$

$l \approx 0.7543702553$

$l = angle\ of\ elevation \approx 0.7543702553\ rads$

$l = angle\ of\ elevation \approx 43.2222318185^{\circ}$

Proof of the Base Angle of elevation:

$l = tan^{-1}(d/i)$

$l = angle\ of\ elevation$

$b = 1 + sin(\pi/14)$

$a = 120$

$b = 120 \cdot cos(\pi/14) \approx 116.9913494618$

$d = height$

$d = a - c$

let:

$HeightGreatPyramid = 120 \times (1 + sin(\pi/14))$

$Capstone\ diameter = 120 - (120 \cdot cos(\pi/14))$

$HeightSecondPyramid = HeightGreatPyramid - capstone\ diameter$

$HeightSecondPyramid = (120 \cdot (1 + sin(\pi/14))) - (120 - (120 \times cos(\pi/14)))$

$HeightSecondPyramid = 120 \cdot (sin(\pi/14) + cos(\pi/14)) \approx 143.6938615366\ meters$

$lateral\ sidelength = 120 \cdot sin(5\pi/14) \approx 108.033345424\ meters$

$d = 120 \cdot (sin(\pi/14) + cos(\pi/14))$

$i = 120 \cdot sin(5\pi/14)$

$l = tan^{-1}(d/i)$

$l = tan^{-1}(120 \cdot (sin(\pi/14) + cos(\pi/14))\ /\ 120 \cdot sin(5\pi/14))$

$l = tan^{-1}((sin(\pi/14) + cos(\pi/14))\ /\ sin(5\pi/14)) = 53.0419420758$

$l = tan^{-1}(\frac{sin(\pi/14)+cos(\pi/14)}{sin(5\pi/14)})$

Slant height:

$c = \sqrt{a^2 + b^2}$

let:

$a = SecondPyramidHeight$

$b = GreatPyramidSidelength$

$a = 120 \cdot (sin(\pi/14) + cos(\pi/14)))$

$b = 120 \cdot sin(5\pi/14)$

$\theta = tan^{-1}(\frac{sin(\pi/14)+cos(\pi/14)}{sin(5\pi/14)})$

$c = \sqrt{a^2 + b^2}$

$c = \sqrt{(120 \cdot (sin(\pi/14) + cos(\pi/14)))^2 + (120 \cdot sin(5\pi/14))^2}$

$a^2 = 120^2 \cdot (1 + 2 \cdot sin(\pi/14) \cdot cos(\pi/14))^2$

$b^2 = (120 \cdot sin(5\pi/14))^2$

$b^2 = 120^2 \cdot (sin(5\pi/14))^2$

$c = \sqrt{a^2 + b^2}$

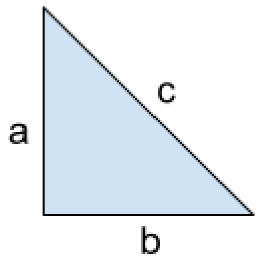
$c = 120 \cdot \sqrt{1 + (2 \cdot sin(\pi/14) \cdot cos(\pi/14)) + (sin(5\pi/14))^2}$

$c = 120 \cdot \sqrt{1 + sin(\pi/7) + (sin(5\pi/14))^2}$

$c = 179.8250605913\ meters$

let:

$a = opposite\ side$ $b = Adjacent\ side$ $c = Hypotenuse$



$a = 120 \cdot (sin(\pi/14) + cos(\pi/14)))$

$b = 120 \cdot sin(5\pi/14)$

$c = 120 \cdot \sqrt{1 + sin(\pi/7) + (sin(5\pi/14))^2}$

Then:

$\theta = tan^{-1}(\frac{sin(\pi/14)+cos(\pi/14)}{sin(5\pi/14)})$

$\theta = sin^{-1}(\frac{sin(\pi/14)+cos(\pi/14)}{\sqrt{1+sin(\pi/7)+(sin(5\pi/14))^2}})$

$\theta = cos^{-1}(\frac{sin(5\pi/14)}{\sqrt{1+sin(\pi/7)+(sin(5\pi/14))^2}})$

Diagonal sidelength of the base:

The diagonal sidelength of the 45-degree triangle at the base of the Great Pyramid is determined by measuring from the center of the base beneath the pyramid to its northwest corner. This measurement can be obtained from any of the four distinct corner points: northeast, southeast, southwest, or northwest.

$\theta = tan^{-1}(\frac{(sin(\pi/14)+cos(\pi/14)))}{\sqrt{2}\times sin(5\pi/14)})$

$c = \sqrt{a^2 + b^2}$

let:

$a = GreatPyramidSidelength$

$b = GreatPyramidSidelength$

$a = 120 \cdot sin(5\pi/14)$

$c = \sqrt{(120 \cdot sin(5\pi/14))^2 + (120 \cdot sin(5\pi/14))^2}$

$c = 120\sqrt{2} \cdot sin(5\pi/14)$

Diagonal Slant height and Diagonal Angle of elevation:

$\theta = tan^{-1}(\frac{(sin(\pi/14)+cos(\pi/14)))}{\sqrt{2}\times sin(5\pi/14)})$

$c = \sqrt{a^2 + b^2}$

let:

$a = SecondPyramidHeight$

$b = GreatPyramidSidelength$

$a = 120 \cdot (sin(\pi/14) + cos(\pi/14)))$

$b = 120 \cdot \sqrt{2} \cdot sin(5\pi/14)$

$\theta = tan^{-1}(\frac{(sin(\pi/14)+cos(\pi/14)))}{\sqrt{2}\times sin(5\pi/14)})$

$c = \sqrt{a^2 + b^2}$

$c = \sqrt{(120 \cdot (sin(\pi/14) + cos(\pi/14)))^2 + (120 \cdot \sqrt{2} \cdot sin(5\pi/14))^2}$

$a^2 = 120^2 \cdot (1 + 2 \cdot sin(\pi/14) \cdot cos(\pi/14))^2$

$b^2 = (120\sqrt{2} \cdot sin(5\pi/14))^2$

$b^2 = 120^2 \cdot 2 \cdot (sin(5\pi/14))^2$

$c = \sqrt{a^2 + b^2}$

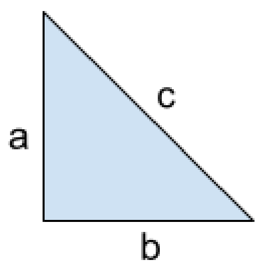
$c = 120 \cdot \sqrt{1 + (2 \cdot sin(\pi/14) \cdot cos(\pi/14)) + 2 \cdot (sin(5\pi/14))^2}$

$c = 120 \cdot \sqrt{1 + sin(\pi/7) + 2 \cdot (sin(5\pi/14))^2}$

$c = 209.8241620740\, meters$

let:

$a = opposite\ side \qquad b = Adjacent\ side \qquad c = Hypotenuse$



$a = 120 \cdot (sin(\pi/14) + cos(\pi/14)))$

$b = 120\sqrt{2} \cdot sin(5\pi/14)$

$c = 120 \cdot \sqrt{1 + sin(\pi/7) + 2 \cdot (sin(5\pi/14))^2}$

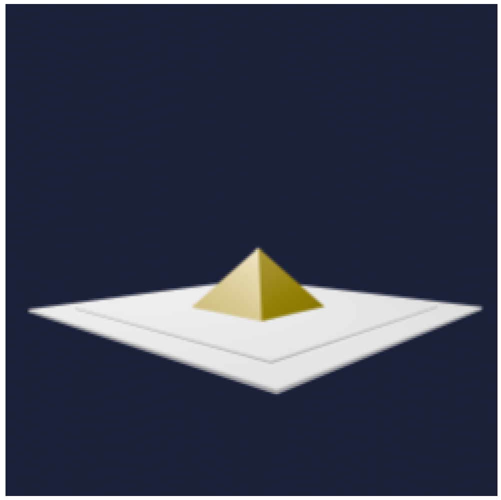
Then:

$\theta = tan^{-1}(\frac{sin(\pi/14)+cos(\pi/14)}{\sqrt{2}\times sin(5\pi/14)})$

$\theta = sin^{-1}(\frac{sin(\pi/14)+cos(\pi/14)}{\sqrt{1+sin(\pi/7)+2\times(sin(5\pi/14))^2}})$

$\theta = cos^{-1}(\frac{120\sqrt{2}\times sin(5\pi/14)}{\sqrt{1+sin(\pi/7)+2\times(sin(5\pi/14))^2}})$

38. Third Pyramid Dimensions



At this juncture in our investigation, we have amassed sufficient information to compute the dimensions of the Third Pyramid of Egypt. Employing many of the same set of formulas previously utilized for determining the dimensions of the Great Pyramid, we will proceed to calculate the dimensions of the Third Pyramid.

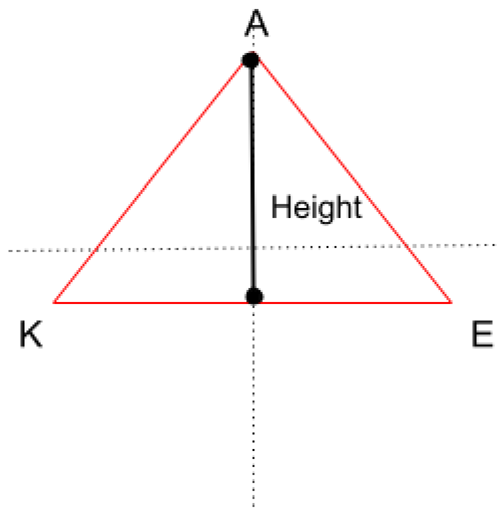
Third Pyramid Dimensions:

Dimensions	Meters	Feet
Height	66. 0867924592	216. 8201852336
Sidelength	52. 7024583428	172. 9083278963
Inner Sidelength	51. 6687349199	169. 5168468501
Difference of Sidelengths	1. 0337234229	3. 3914810462
Width	105. 4049166856	345. 8166557926
Inner Width	103. 3374698399	339. 0336937003
Diagonal Sidelength	74. 5325313588	244. 5293023582
Total Dia. Sidelength	149. 0650627176	489. 0586047165
Slant height	84. 5281802295	277. 3234259500
Inner Slant height	83. 8875575146	275. 2216453892
Diagonal Slant height	99. 6120593517	326. 8112183456

Outer side angle A			
Angle	**Radian**	**Radian**	**Degree**
Base Angle	$2\pi/7$	0.8975979010	51.4285714286
Inner Base Angle	$cot^{-1}(cos\ (3\pi/14))$	0.9072323456	51.980584438
Base Diagonal Angle	$tan^{-1}(\frac{1+sin(\pi/14)}{\sqrt{2}\cdot cos(\pi/14)})$	0.7254092153	41.5628864579

Definitions and Calculations:

The dimensions of a third pyramid that accompanies any Great Pyramid at any scale can be calculated using the formulas given here, below:



$height\ =\ 66.03610783\ meters$

$sidelength\ =\ 52.6620387\ meters$

$width\ =\ 105.3240774\ meters$

$slant\ height\ =\ 84.46335216\ meters$

Calculations:

Given:

$a\ =\ great\ pyramid\ radius\ \approx\ 120\ meters$

$b\ =\ great\ pyramid\ height\ \approx\ 146.7025120748\ meters$

$angle\ of\ elevation\ =\ 2\pi/7$

$angle\ B\ =\ 5\pi/14$

$Angle\ D\ =\ \pi/14$

Height:

$a\ =\ pyramid\ radius\ =\ 120\ meters$

$Angle\ B\ =\ 5\pi/14$

$radiusXAtPointB = a \cdot cos(5\pi/14)$

$radiusXAtPointB = 120 \cdot cos(5\pi/14)$

$c = radiusXAtPointB = 52.0660486941$

$Angle\ D = \pi/14$

$radiusYAtPointD = a \cdot sin(\pi/14)$

$radiusYAtPointD = 120 \cdot sin(\pi/14)$

$radiusYAtPointD = 26.7025120748$

$diameter = 2 \cdot r$

$diameter = 53.4050241495$

$c = radiusXAtPointB = 52.0660486941$

$d = 26.7025120748$

$f = (c - d) / 2$

$f = 12.6817683097$

$g = height = diameter + f$

$g = 240 \cdot sin(\pi/14) + (120 \cdot cos(5\pi/14) - 120 \cdot sin(\pi/14)) / 2$

$g = 60 \cdot cos(5\pi/14) + 180 \cdot sin(\pi/14)$

$height = 66.0867924592\ meters$

Outer sidelength:

$g = 60 \cdot cos(5\pi/14) + 180 \cdot sin(\pi/14)$

$g = height \approx 66.0867924592\ meters$

$h = sidelengtht$

$angle\ of\ elevation = 2\pi/7$

$tan(2\pi/7) = g / h$

$h = g / tan(2\pi/7)$

$h = (60 \cdot cos(5\pi/14) + 180 \cdot sin(\pi/14)) / tan(2\pi/7)$

$h \approx 52.7024583428$

$h = third\ sidelength \approx 52.7024583428\ meters$

Outer width:

$h = third\ sidelength \approx 52.7024583428\ meters$

$width = 2 \times h$

$width = 105.4049166856\ meters$

Outer slant height:

$g = height \approx 66.0867924592\ meters$

$h = third\ sidelength \approx 52.7024583428\ meters$

$i = slant\ height$

$i = \sqrt{g^2 + h^2}$

$i = 84.5281802295$

$i = slant\ height = 84.5281802295\ meters$

Inner sidelength:

$j = inner\ sidelength$

$third\ height = 66.03610783\ meters$

$g = height \approx 66.0867924592\ meters$

$Angle\ C = 3\pi/14$

$j = g \cdot cos(3\pi/14)$

$j \approx 51.6687349199$

$j = inner\ sidelength \approx 51.668734919\ meters$

Inner width:

$j = inner\ sidelength \approx 51.668734919\ meters$

$width = 2 \times j$

$width = 103.3374698399\ meters$

Inner slant height:

$g = height \approx 66.0867924592\ meters$

$j = inner\ sidelength \approx 51.668734919\ meters$

$k = slant\ height$

$k = \sqrt{g^2 + j^2}$

$k = 83.8875575146$

$k = slant\ height = 83.8875575146\ meters$

Third sidelength difference:

$h = third\ sidelength \approx 52.7024583428\ meters$

$j = inner\ sidelength \approx 51.668734919\ meters$

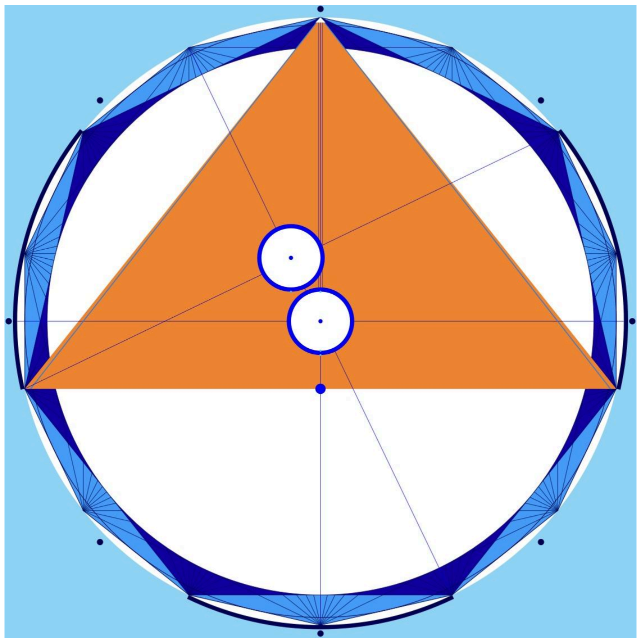
$l = \ difference$

$l = h\ - j$

$l = difference = 1.0337234229\ meters$

39. Chamber Design Radius

In the design of both the King's and Queen's chambers, a specific chamber design radius is utilized. While this radius has been previously employed in our calculations, this section aims to provide a comprehensive definition of it.



Chamber Design Radius:

Design Radius	Meters	Feet
Chamber	13. 3512560374	43. 8033334560
King's Chamber	11. 5857857828	38. 0111082114
Queen's Chamber	10. 7068760368	35. 1275460524
Difference King-Queen	0. 8789097461	2. 8835621590

Definition and Calculations:

The design radii encompass a crucial set of invisible parameters pivotal for reverse-engineering the architectural blueprints of both the King's and Queen's Chambers. Let's now delve into the calculations required to determine these values.

$CD\ radius = 60 \cdot (sin\, \pi/14) \approx 13.3512560374\ meters$

$KC\ radius = 120 \cdot (sin\, \pi/14) \cdot (cos\, 5\pi/14) \approx 11.5857857828\ meters$

$QC\ radius = 60 \cdot (sin\, \pi/14)) \cdot (2 \cdot sin\, 5\pi/14 - 1) \approx 10.7068760368\ meters$

$KQ\ difference = 60 \cdot sin\, \pi/14 \cdot (2 \cdot cos\, 5\pi/14 - 2 \cdot sin\, 5\pi/14 + 1)) \approx 0.8789097461\ meters$

Given:

$a = pyramid\ radius = 120\ meters$

$angle\ B = 5\pi/14$

Radius 7:

$a = pyramid\ radius = 120\ meters$

$angle\ D = \pi/14$

$b = radius\ 7$

$b = a \cdot sin(\pi/14)$

$b = 120 \cdot (sin\, \pi/14)$

$b = chamber\ radius \approx 26.7025120748\ meters$

$b = radius\ 7 \approx 26.7025120748\ meters$

Chamber radius:

$b = chamber\ radius = 120 \cdot (sin\, \pi/14) \approx 26.7025120748\ meters$

$c = b\, /\, 2$

$c = 120 \cdot (sin\, \pi/14) / 2$

$c = 60 \cdot (sin\, \pi/14)$

$c = CD\, radius \approx 13.3512560374\, meters$

KC radius:

$a = radius\, 7 = 120 \cdot (sin\, \pi/14) \approx 26.7025120748\, meters$

$angle\, N = 9\pi/14$

$angle\, N = 5\pi/14$

$b = KC\, radius$

$b = abs(a \cdot cos(9\pi/14))$

$b = a \cdot cos(5\pi/14)$

$b = 120 \cdot (sin\, \pi/14) \cdot (cos\, 5\pi/14)$

$b = KC\, radius \approx 11.5857857828\, meters$

QC radius:

$a = radius\, 7 = 120 \cdot (sin\, \pi/14) = 26.7025120748$

$b = CD\, radius \approx 13.3512560374\, meters$

$angle\, B = 5\pi/14$

$c = a \cdot sin(5\pi/14)$

$c = 120 \cdot (sin\, \pi/14)) \cdot (sin\, 5\pi/14) \approx 24.0581320741$

$b = QC\, radius$

$b = c - b$

$b = 120 \cdot (sin\, \pi/14)) \cdot (sin\, 5\pi/14) - 60 \cdot sin\, \pi/14$

$b = 60 \cdot (sin\, \pi/14)) \cdot (2 \cdot sin\, 5\pi/14 - 1)$

$b = QC\, radius \approx 10.7068760368\, Meters$

QC radius difference:

$a = KC\,radius = 120 \cdot (sin\,\pi/14) \cdot (cos\,5\pi/14) \approx 11.5857857828\,meters$

$b = QC\,radius = 60 \cdot (sin\,\pi/14)) \cdot (2 \cdot sin\,5\pi/14 - 1) \approx 10.7068760368\,meters$

$c = CR\,difference$

$c = a - b$

$c = 120 \cdot (sin\,\pi/14) \cdot (cos\,5\pi/14) - 60 \cdot (sin\,\pi/14)) \cdot (2 \cdot sin\,5\pi/14 - 1)$

$c = 60 \cdot sin\,\pi/14 \cdot (2 \cdot cos\,5\pi/14 - (2 \cdot sin\,5\pi/14 - 1))$

$c = 60 \cdot sin\,\pi/14 \cdot (2 \cdot cos\,5\pi/14 - 2 \cdot sin\,5\pi/14 + 1))$

$c \approx 0.8789097461$

$c = CR\,difference \approx 0.8789097461\,meters$

Chamber radius 2:

$pyramid\,height = 120 \cdot (1 + sin\,\pi/14)$

$a = great\,pyramid\,height \approx 146.7025120748\,meters$

$angle\,D = \pi/14$

$b = radius\,7$

$b = a \cdot sin(\pi/14)$

$b = 120 \cdot (1 + sin\,\pi/14) \cdot sin(\pi/14)$

$b \approx 32.6443800006$

$b = radius\,7 \approx 32.6443800006\,meters$

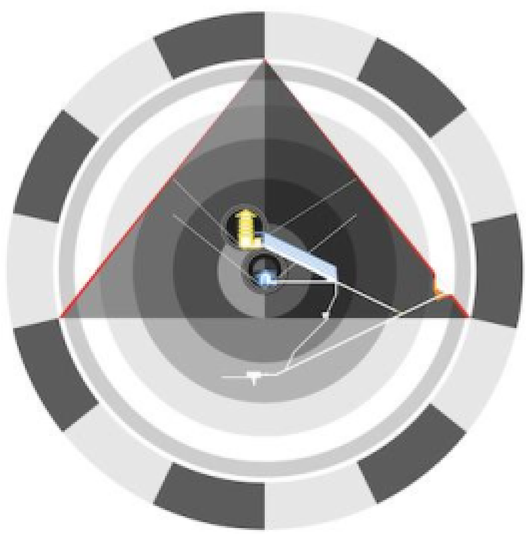
$c = chamber\,radius$

$c = b\,/\,2$

$c = CD\,radius \approx 16.3221900003\,meters$

40. Angles of the pyramid

In this section, we present a compilation of the most notable angles identified in our study, as documented in this White Paper on the Great Pyramid.

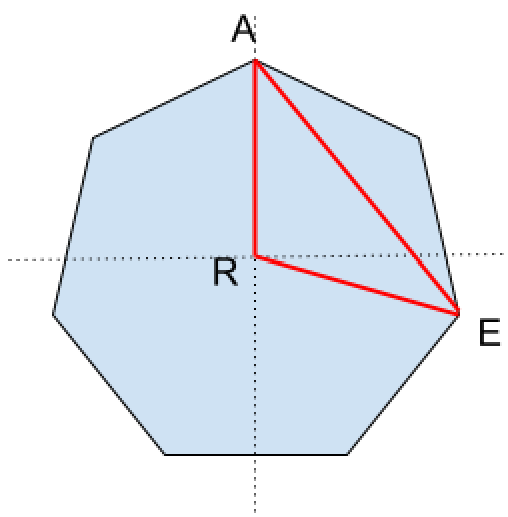


Definition and Calculations:

Below is a list of the most notable angles revealed in our white paper, The Great Ratio.

Triangle 1:

Triangle 1	Radians	Degrees
Angle A	$3\pi/14$	38.5714285714
Angle E	$3\pi/14$	38.5714285714
Angle R	$4\pi/7$	102.8571428571



Angle E:

$E = 3\pi/14$

Angle A:

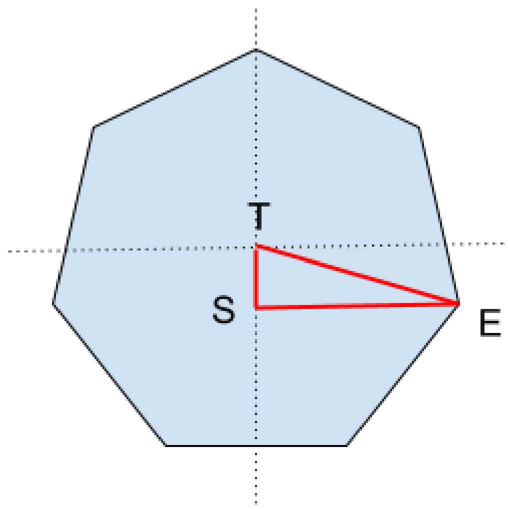
$A = 3\pi/14$

Angle R:

$R = 4\pi/7$

Triangle 2 :

Triangle 2	Radians	Degrees
Angle T	$3\pi/7$	77.1428571429
Angle E	$\pi/14$	12.8571428571
Angle S	$\pi/2$	90



Angle E:

$E = \pi/14$

Angle T:

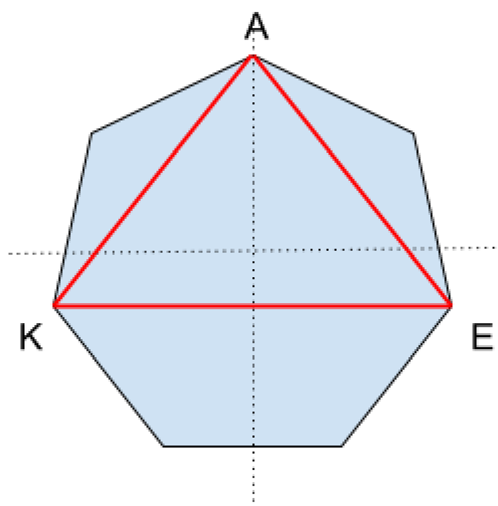
$T = 3\pi/7$

Angle K:

$K = \pi/2$

Triangle 4:

Triangle 4	Radians	Degrees
Angle A	$3\pi/7$	77.1428571429
Angle E	$2\pi/7$	51.4285714286
Angle K	$2\pi/7$	51.4285714286



Angle A:

$A = 3\pi/7$

Angle E:

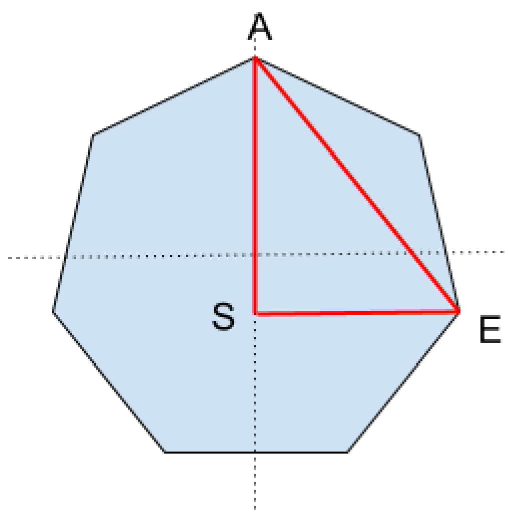
$E = 2\pi/7$

Angle K:

$K = 2\pi/7$

Outer angle of elevation:

Triangle	Radians	Degrees
Angle A	$3\pi/14$	38. 5714285714
Angle E	$2\pi/7$	51. 4285714286
Angle S	$\pi/2$	90



Angle A:

$A = 3\pi/14$

Angle E:

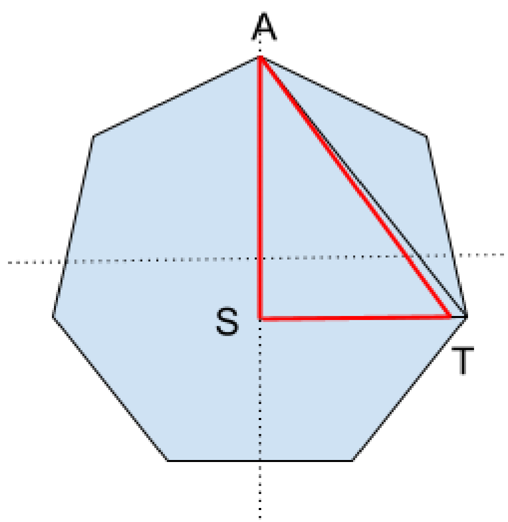
$E = 2\pi/7$

Angle S:

$C = \pi/2$

Inner angle of elevation:

Triangle	Radians	Degrees
Angle T	$cot^{-1}(cos\ (3\pi/14))$	51.980584438
Angle A	$tan^{-1}(cos\ (3\pi/14))$	38.0194155620
Angle S	$\pi/2$	90



$T\ =\ cot^{-1}(cos\ (3\pi/14))$ $A\ =\ tan^{-1}(cos\ (3\pi/14))$

Inner angle of elevation:

The inner width of the pyramid is the angle from the middle point between two consecutive corners along one side to the pyramid's top.

Definition and Calculations:

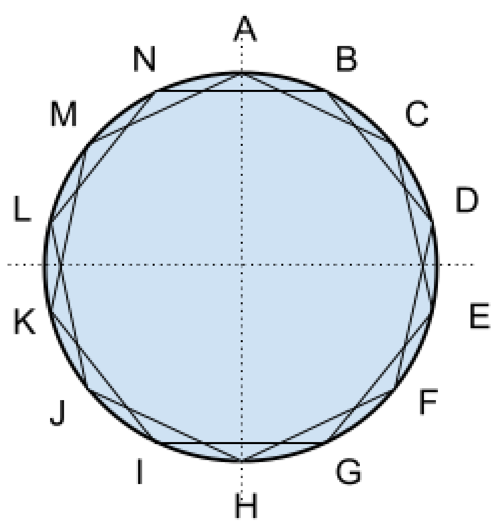
$\theta\ =\ cot^{-1}(cos\ (3\pi/14))$

$\theta\ =tan^{-1}(Sec\ (3\pi/14))$

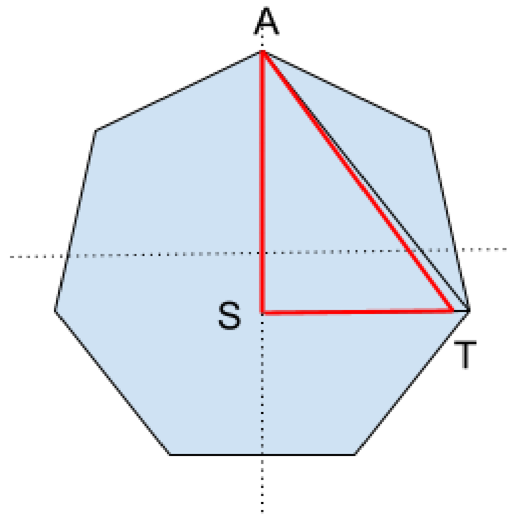
Given:

Unit circle

Tetradecagon



Hexagon

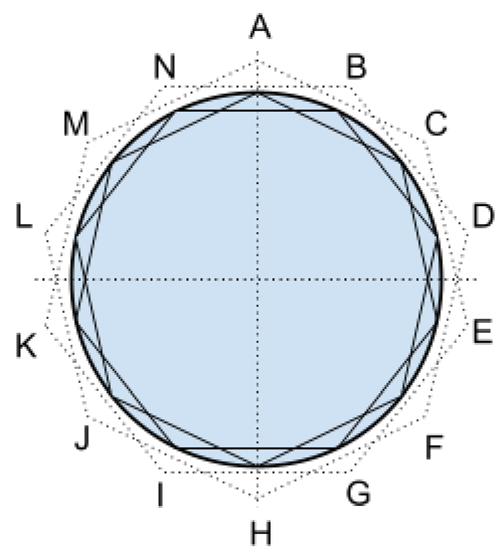


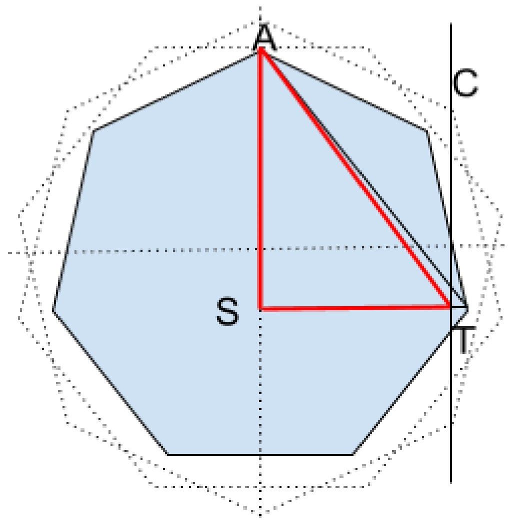
- **The opposite side is the pyramid's height.**

$opposite\ side\ =\ segment\ AS$

$opposite\ side\ =\ 1\ +\ sin\ \pi/14$

- **"We define the adjacent side, which is the inner side of the Great Pyramid at the midpoint of the concavity, as the cosine at point C of the dodecagon in the next iteration of the pyramid. In this context, point A is at $\pi/2$, point B is at $5\pi/14$, and point C is at $3\pi/14$, moving clockwise."**





$opposite\ side\ =\ segment\ ST$

$radius\ =\ 1\ +\ sin\,\pi/14$

$\theta\ =\ 3\pi/14$

$adjacent\ side\ =\ radius\ \cdot\ cos\,\theta$

$adjacent\ side\ =\ (1\ +\ sin\,\pi/14)\ \cdot\ (cos\,3\pi/14)$

Inner angle of elevation of Pyramid-1:

$tan\,\theta\ = \frac{opposite\ side}{adjacent\ side}$

$tan\,\theta\ = \frac{AS}{ST}$

$tan\,\theta\ = \frac{1\ +\ sin\,\pi/14}{(1+sin\,\pi/14)\ \cdot\ (cos\,3\pi/14)}$

$tan\,\theta\ = \frac{1}{cos\,3\pi/14}$

$tan\,\theta\ =\ sec\,3\pi/14$

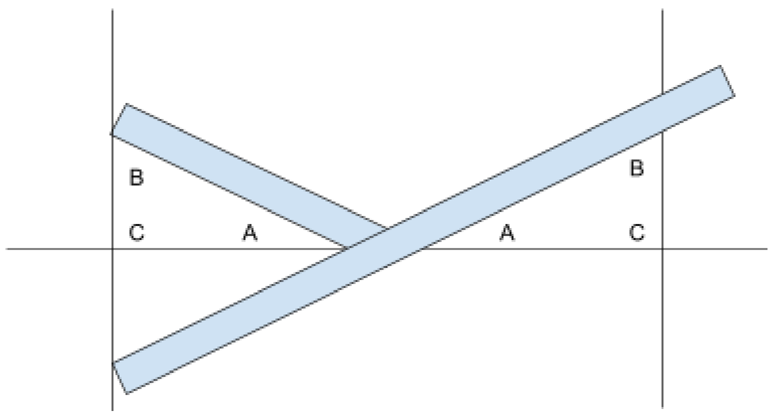
$\theta\ =\ cot^{-1}(cos\,(3\pi/14))$

$complement\ =\ tan^{-1}(cos\,(3\pi/14))$

$\theta\ \approx\ 0.9072323456\,rad$

Descending and ascending passages:

Triangle	Radians	Degrees
Angle A	$\pi/7$	25. 7142857143
Angle B	$5\pi/14$	64. 2857142857
Angle C	$\pi/2$	90



$\theta = \pi/7$ $complement = 5\pi/14$

Queen north shaft:

$\theta = 3\pi/14$

Queen south shaft:

$\theta = 11\pi/14$

$\theta = 3\pi/14$

King north shaft:

$A = tan^{-1}(\frac{1+sin(\pi/14)}{1-sin(\pi/14)})$ $B = tan^{-1}(\frac{1-sin(\pi/14)}{1+sin(\pi/14)})$ $C = \pi/2$

Shafts of the King's Chamber:

$North\ Angle\ = tan^{-1}\left(\frac{1 - sin\,\pi/14}{1 + sin\,\pi/14}\right)$

$North\ Angle\ = tan^{-1}\left(\left(sec\,\pi/14\ -\ tan\,\pi/14\right)^{2}\right)$

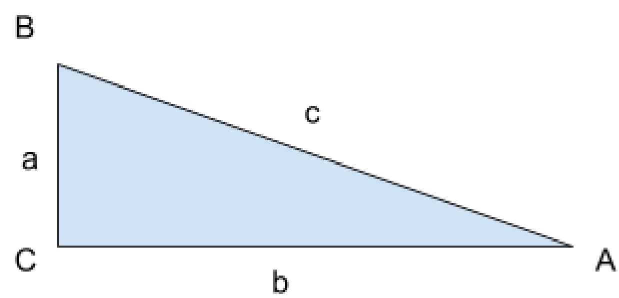
King south shaft:

$A\ =\ 3\pi/4$

$A\ =\ \pi/4$

Angles of the Roof of the King's Stress Relieving Chamber:

Triangle	Radians	Degrees
Angle A	0.5240031362	30.0231681552
Angle B	1.0467931906	59.9768318448
Angle C	$\pi/2$	90



$A\ =\ atan\left(\frac{6 \cdot tan(\pi/7)}{5}\right)$

$A\ =\ 0.5240031362\,rad$

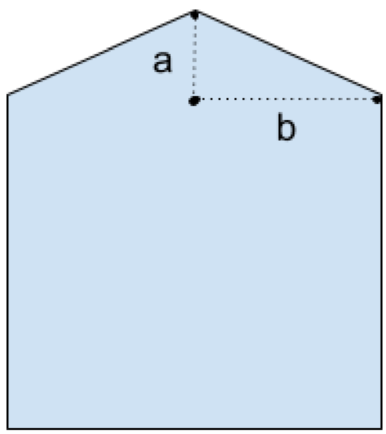
$B\ =\ atan\left(\frac{5}{6 \cdot tan(\pi/7)}\right)$

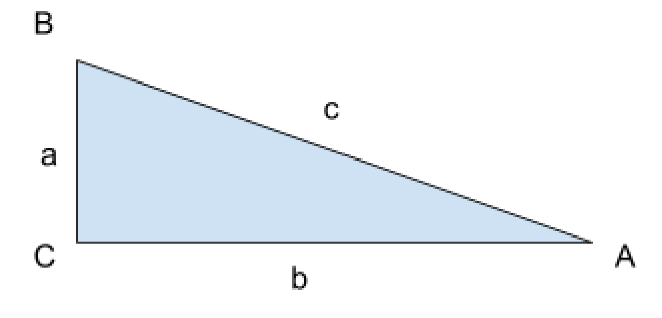
$B\ =\ 1.0467931906\,rad$

$C\ =\ \pi/2$

Queen's Chamber Roof Angles:

Triangle	Radians	Degrees
Angle A	0.5240031362	30.0231681552
Angle B	1.0467931906	59.9768318448
Angle C	π/2	90





Angle A:

$A = atan\left(\frac{6 \cdot tan(\pi/7)}{5}\right)$ $A = 0.5240031362\, rad$

Angle B:

$B = atan\left(\frac{5}{6 \cdot tan(\pi/7)}\right)$ $B = 1.0467931906\, rad$

Angle C:

$C = \pi/2$

Pyramid 2:

$\theta = tan^{-1}$ (($sin\, \pi/14 \ + \ cos\, \pi/14$) / ($sin\, 5\pi/14$))

$\theta = tan^{-1}$ (($sin\, \pi/14 \ + \ cos\, \pi/14$) $\cdot$ ($csc\, 5\pi/14$))

Chevron blocks at the entrance:

$\theta = tan^{-1}$ (($sin\, \pi/14 \ + \ cos\, \pi/14$) / ($sin\, 5\pi/14$))

$\theta = tan^{-1}$ (($sin\, \pi/14 \ + \ cos\, \pi/14$) $\cdot$ ($csc\, 5\pi/14$))

Shafts of the King's Chamber:

$North\ Angle \ = tan^{-1} \left(\frac{1 - sin\, \pi/14}{1 + sin\, \pi/14}\right)$

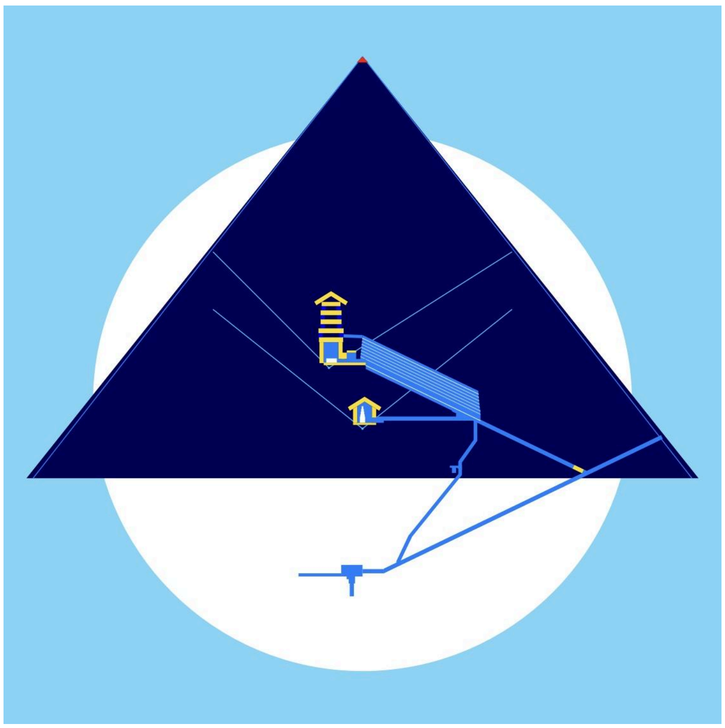
$North\ Angle \ = tan^{-1} \left((sec\, \pi/14 \ - \ tan\, \pi/14\,)^2 \right)$

New trigonometric identity:

$\frac{1 - sin\, \pi/14}{1 + sin\, \pi/14} = \ (sec\, \pi/14 \ - \ tan\, \pi/14\,)^2$

41. Subterranean Chamber

In this section on the subterranean chamber, we will calculate the depth of the chamber's design and the length of the descending passageway. Due to the unfinished state of the subterranean chamber, our calculations will be limited in scope.



Subterranean Chamber:

Subterranean Chamber	Meters	Feet
Depth from ground	32. 6443800006	107. 1009842540
Distance to the top of Py.	179. 3468920754	588. 4084385675
Length	14. 1638656558	46. 4693755113
Width	8. 1610950002	26. 7752460635

Definition and Calculations:

The dimensions of a third pyramid that accompanies any Great Pyramid at any scale can be calculated using the formulas given here, below:

$r2 = 120 \cdot (1 + sin(\pi/14))^2$

$D = 120 \cdot (1 + sin(\pi/14))^2 \cdot (sin(\pi/14))$

Calculations for the Fourth Iteration:

$r = 120 \cdot (1 + sin(\pi/14)) = 146.7025120748$

$r2 = r \cdot (1 + sin(\pi/14))$

$r2 = 120 \cdot (1 + sin(\pi/14)) \cdot (1 + sin(\pi/14))$

$r2 = 120 \cdot (1 + sin(\pi/14))^2$

$r2 = 179.3468920754\ meters$

$r2 = 588.4084385675\ feet$

Vertical Distance from ground level to subterranean chamber:

$r2 = 120 \cdot (1 + sin(\pi/14)) \cdot (1 + sin(\pi/14))$

$D = r2 \cdot (sin(\pi/14))$

$D = 120 \cdot (1 + sin(\pi/14))^2 \cdot (sin(\pi/14))$

$D = 32.6443800006\ meters$

$D = 107.1009842540\ feet$

Length of the subterranean chamber:

Calculations for the Radius 2 of the King's Chamber Design:

$y = 120 \cdot (1 + sin(\pi/14)) \cdot sin(\pi/14) \cdot cos(5\pi/14)$

$r2 = 14.1638656558 = length$

$length \ = 14.1638656558 \, meters$

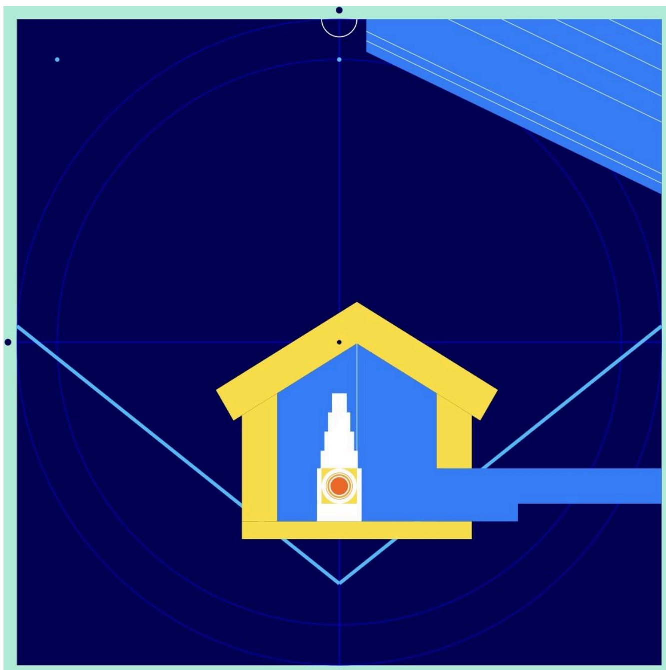
Width of the subterranean chamber:

$width \ = length/2$

$width \ = 8.1610950002 \, meters$

42. Queen's Chamber

This section provides essential measurements and calculations concerning the Queen's Chamber, many of which are being computed for the first time in millennia.



Queen's chamber	Meters	Feet
Apex y-value	1. 5523349271	5. 0929623594
Apex x-value	2. 6862139090	8. 8130377593
Apex hypotenuse	3. 1024972024	10. 1787965959
Apex total width	5. 37242781810	17. 6260755187
Apex max height	6. 2327280644	20. 4485828883
Wall height	4. 6803931372	15. 3556205290

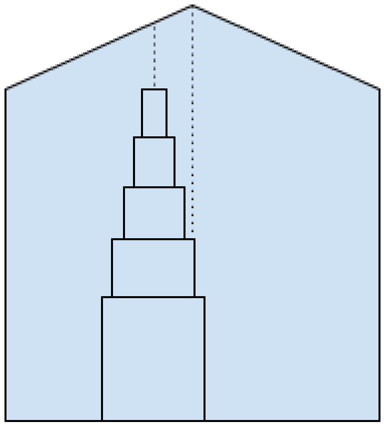
Width North-South	5. 2381171226	17. 1854236307
Length East-West	5. 8064076222	5. 8064076222
Passageway height	1. 1925890027	3. 9126935783
Corridor height	1. 7100339784	5. 6103476981
Corridor width	1. 0744855636	3. 5252151037
Niche width	1. 5919305393	5. 2228692235
Niche height	4. 6803931372	15. 3556205290

Angles of Queen's Chamber

Queen's chamber	Radian	Radian	Degree
Roof angle	$atan\left(\frac{6 \cdot tan(\pi/7)}{5}\right)$	0. 5240031362	30. 0231681552
Complement	$atan\left(\frac{5}{6 \cdot tan(\pi/7)}\right)$	1. 0467931906	59. 9768318448
Right angle	$\pi/2$	1. 5707963268	90
North Shaft	$3\pi/14$	0. 6731984258	38.5714285714
South Shaft	$3\pi/14$	0. 6731984258	38.5714285714

Definition and Calculations:

Presented below are the most significant measurements of the Queen's Chamber.



Width of the Queen's Passageway: Pw

$$Pw = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$Pw \approx 1.0744855636\, m$$

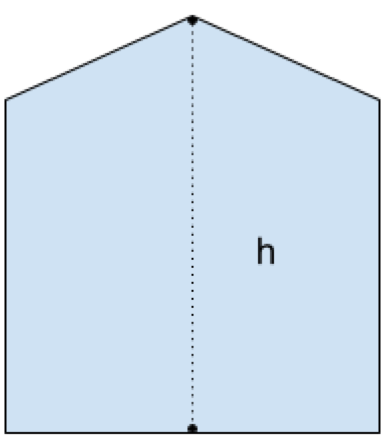
Passageway Hidden Side: Pb

$$Pb = Pw \cdot tan(\pi/7)$$

$$Pb = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot tan(\pi/7)$$

$$Pb \approx 0.5174449757$$

Vertical Height of the Queen's Passageway: Ph



$Pw = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$Ph = Pw / cos(\pi/7)$

$Ph = (120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)) / cos(\pi/7)$

$Ph \approx 1.1925890027\, m$

Part A of the Queen's chamber height: Up

$Pb = Pw \cdot tan(\pi/7)$

$Pb = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot tan(\pi/7)$

$Pb \approx 0.5174449757$

$Up = 10 \cdot Pb$

$Up = 10 \cdot 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot tan(\pi/7)$

$Up = 1200 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot tan(\pi/7)$

$Up = 5.1744497571\, meters$

Adjustment Value: ad

$Pw = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$Pw \approx 1.0744855636\, m$

$ad = Pw / 8$

$ad = 15 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$ad = 0.1343106955\, meters$

Height of Queen's Chamber: Qh

- **Part A of the Queen's chamber height: Up**

$Up = 1200 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot tan(\pi/7)$

$Up = 5.1744497571\ meters$

- **Passageway Vertical Height: Ph**

$Ph = (120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2))\ /\ cos(\pi/7)$

$Ph \approx 1.1925890027\ m$

- **Adjustment value: ad**

$ad = 15 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$ad = 0.1343106955\ meters$

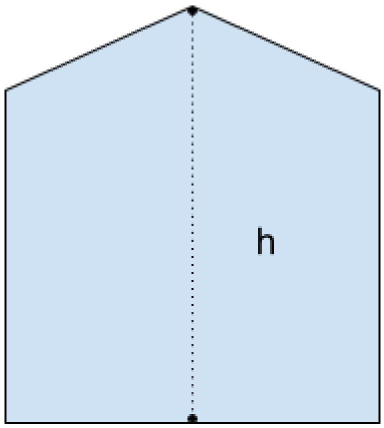
- **Height of Queen's Chamber: Qh**

$Qh = Up + Ph - ad$

$Qh = 5.1744497571 + 1.1925890027 - 0.1343106955$

$Qh = 6.2327280644\ meters$

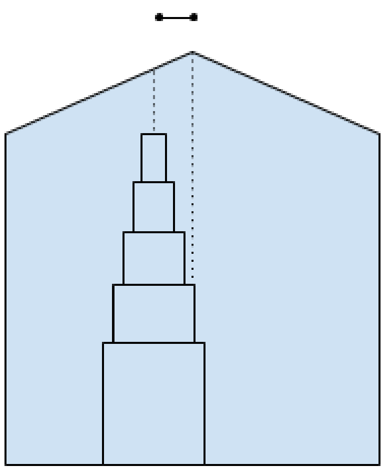
Formula for the height of Queen's Chamber: Qh



$$Qh = 15 \cdot (sin(\pi/14) + sin^2 \pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot \frac{80 \cdot sin(\pi/7) - cos(\pi/7) + 8}{cos(\pi/7)}$$

$$Qh = 6.2327280644\ meters$$

Great Step shift: sh



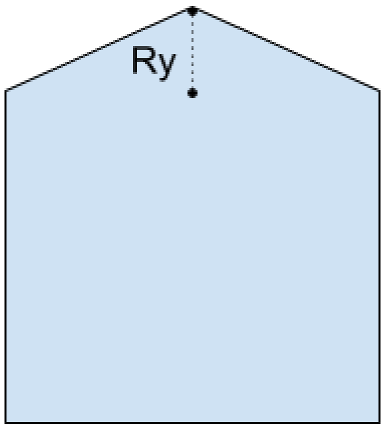
$$Pw = 120 \cdot (sin(\pi/14) + sin^2 \pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

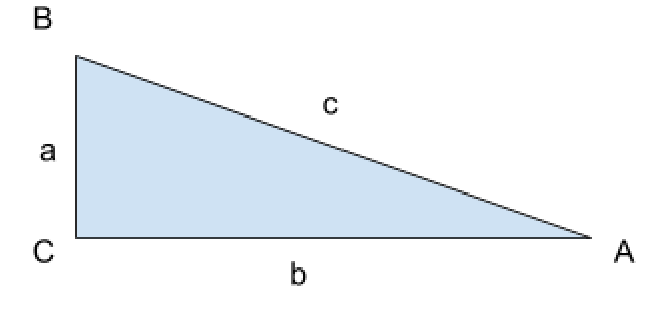
$$sh = Pw/2$$

$$sh = 60 \cdot (sin(\pi/14) + sin^2 \pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$sh = great\ step\ shift \approx 0.5395810861\ meters$$

Y-value of the Queen's Chamber Roof: Ry





$Pb = Pw \cdot tan(\pi/7)$

$Pb = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot tan(\pi/7)$

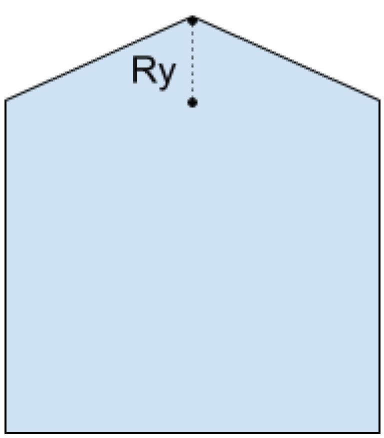
$Pb \approx 0.5174449757$

$Ry = 3 \cdot Pb$

$Ry = 3 \cdot 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot tan(\pi/7)$

$Ry = 1.5523349271\ meters$

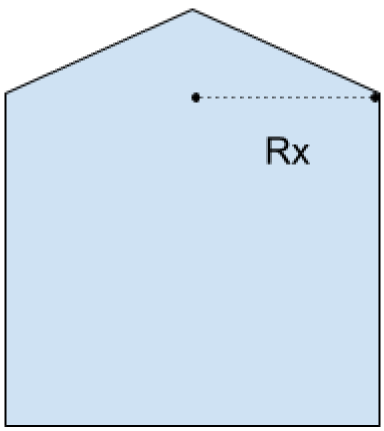
Formula for the y-value of the Queen's Chamber Roof: Ry

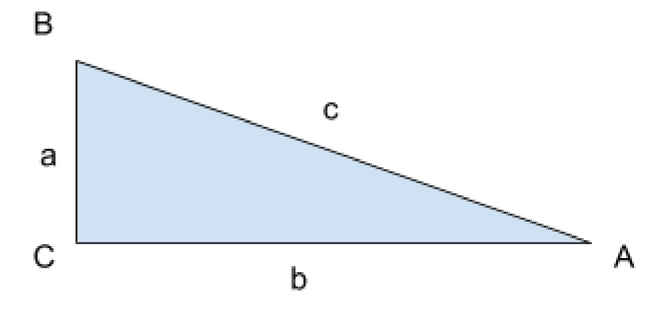


$$Ry = 360 \cdot (sin(\pi/14) + sin^{2}\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot tan(\pi/7)$$

$$Ry = 1.5523349271\, meters$$

X-value of the Queen's Chamber Roof: Rx





$$Pw = 120 \cdot (sin(\pi/14) + sin^{2}\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$sh = Pw/2$$

$$sh = 60 \cdot (sin(\pi/14) + sin^{2}\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$sh = great\ step\ shift \approx 0.5395810861\, meters$$

$$Rx = 5 \cdot sh$$

$$Rx = 5 \cdot 60 \cdot (sin(\pi/14) + sin^{2}\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

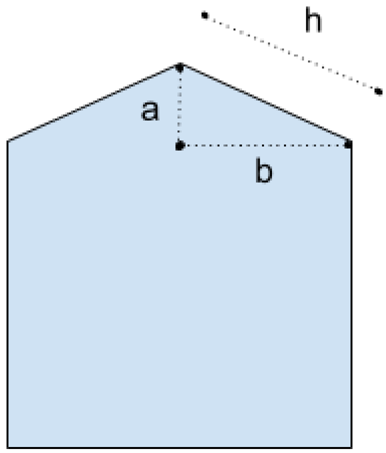
$$Rx = 2.6862139090\, meters$$

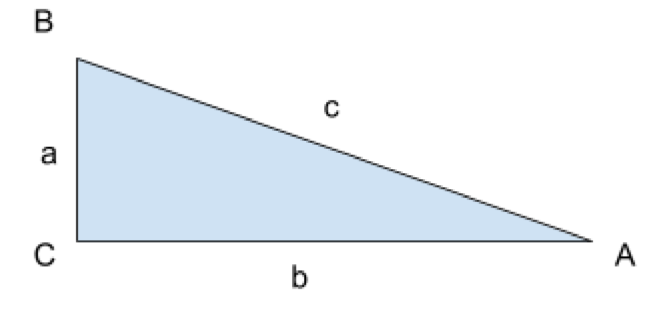
Formula for the X-value of the Queen's Chamber Roof: Rx

$$Rx = 300 \cdot (sin(\pi/14) + sin^{2}\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$Rx = 2.6862139090\, meters$$

Formula for the hypotenuse Queen's Chamber Roof Angle: h





$Ry\ =\ 3\cdot 120\cdot (sin(\pi/14)\ +\ sin^{2}\pi/14))\cdot (cos(5\pi/14)\ -\ sin(5\pi/14)\ +\ 1/2)\cdot tan(\pi/7)$

$Ry\ =\ 1.5523349271$

$Ry\ =\ 5\cdot 60\cdot (sin(\pi/14)\ +\ sin^{2}\pi/14))\cdot (cos(5\pi/14)\ -\ sin(5\pi/14)\ +\ 1/2)$

$Ry\ =\ 2.6862139090$

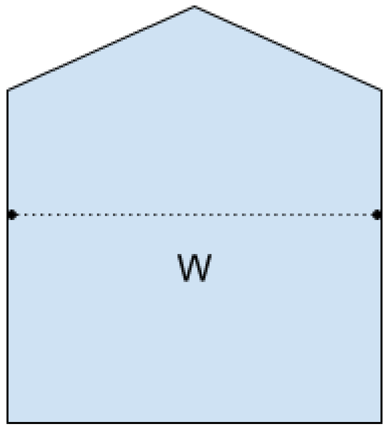
$Ky\ =\ a$

$Kx\ =\ b$

$h\ =\sqrt{a^{2}\ +\ b^{2}}$

$h\ =\ 3.1024972024\ meters$

Width of the Queen's Chamber: Qw



$$Pw = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$sh = Pw/2$$

$$sh = 60 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$sh = great\ step\ shift \approx 0.5395810861\ meters$$

$$ad = Pw / 8$$

$$ad = 15 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$ad = 0.1343106955\ meters$$

$$Qw = 10 \cdot sh - ad$$

$$Qw = 10 \cdot Pw/2 - Pw / 8$$

$$Qw = 585 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

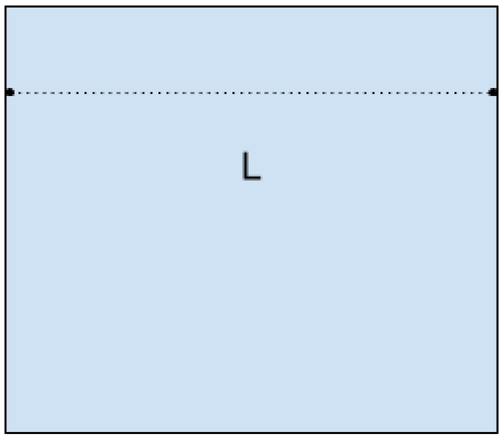
$$Qw = 5.2381171226\ meters$$

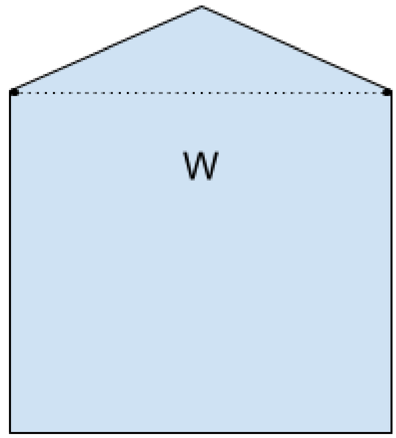
Formula for the width of Queen's Chamber: Qw

$$Qw = 585 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$Qw = 5.2381171226\, meters$

Length of the Queen's Chamber: Rx





$Pb = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot tan(\pi/7)$

$Pb \approx 0.5174449757$

$Pw = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$Pw \approx 1.0744855636\, m$

$Rx = 12 \cdot Pb - 3 \cdot (Pw/8)$

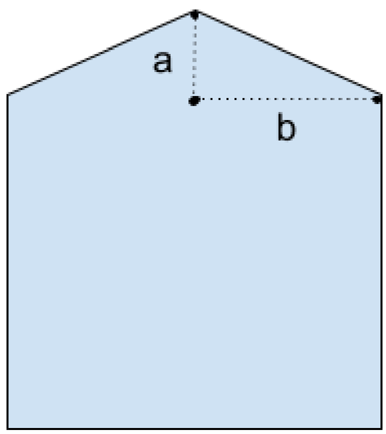
$Rx = 5.8064076222\, meters$

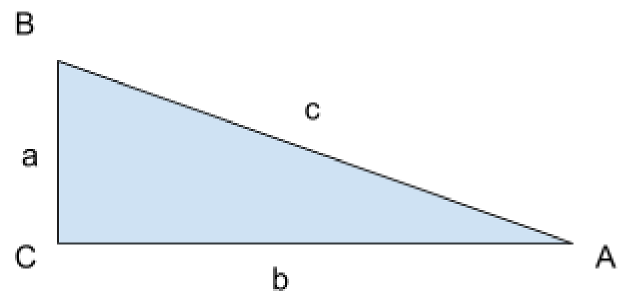
Formula for the Length of Queen's Chamber: Rx

$Rx = 45 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot (32 \cdot tan(\pi/7) - 1)$

$Rx = 5.8064076222\, meters$

Queen's Chamber Roof Angle: rA





$$Ry = 3 \cdot 120 \cdot (sin(\pi/14) + sin^2 \pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot tan(\pi/7)$$

$$Ry = 5 \cdot 60 \cdot (sin(\pi/14) + sin^2 \pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$tan\ A = \frac{Ry}{Rx}$$

$$tan\ B = \frac{Rx}{Ry}$$

$$tan\ A = \frac{6 \cdot tan(\pi/7)}{5}$$

$$tan\ B = \frac{5}{6 \cdot tan(\pi/7)}$$

Angle A:

$$tan\ A = \frac{6 \cdot tan(\pi/7)}{5}$$

$$A = atan\left(\frac{6 \cdot tan(\pi/7)}{5}\right)$$

$$A = 0.5240031362\ rad$$

$$A = 30.0231681552\ deg$$

Angle B:

$$tan\ B = \frac{5}{6 \cdot tan(\pi/7)}$$

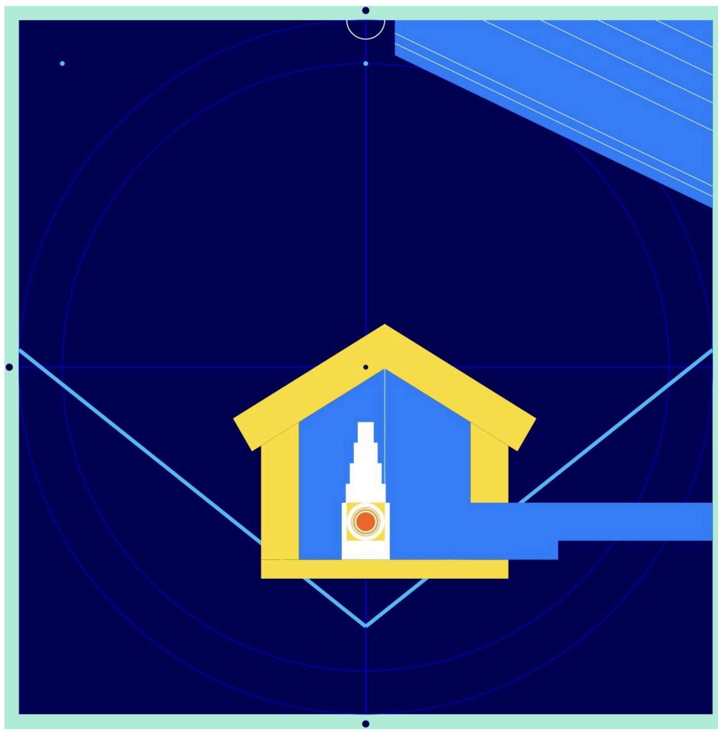
$$B = atan\left(\frac{5}{6 \cdot tan(\pi/7)}\right)$$

$$B = 1.0467931906\ rad$$

$$B = 59.9768318448\ deg$$

43. The Niche

While it is a component of the Queen's Chamber, this section is dedicated to providing calculations specifically related to the Niche.



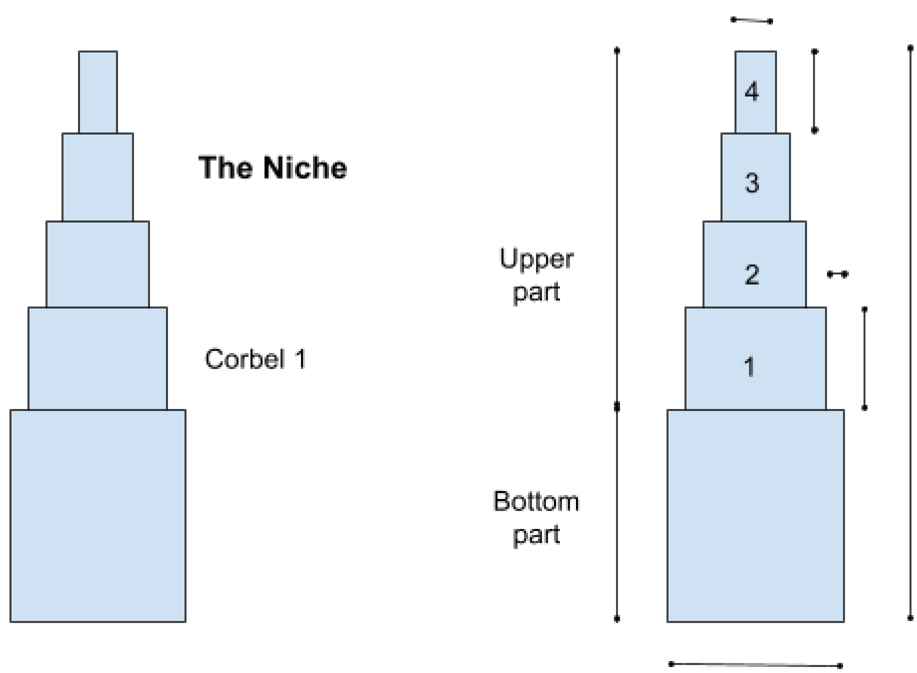
The Niche:

Niche	Meters	Feet
Height	4. 6803931372	15. 3556205290
Width	1. 5919305393	5. 2228692235
Bottom height	1. 7100339784	5. 6103476981
Offset from Ceiling C.	0. 5372427818	1. 7626075519
Upper height	2. 9703591588	9. 7452728308

Corbel 1 height	0. 8550169892	2. 8051738491
Corbel 1 width	1. 3233091484	4. 3415654476
Corbel 2 height	0. 7051140565	2. 3133663272
Corbel 2 width	1. 0546877575	3. 4602616717
Corbel 3 height	0. 7051140565	2. 3133663272
Corbel 3 width	0. 7860663666	2. 5789578957
Corbel 4 height	0. 7051140565	2. 3133663272
Corbel 4 width	0. 5174449757	1. 6976541198
Corbel side difference	0. 1343106955	0. 4406518880
Queen's chamber Height	6. 2327280644	20. 4485828883

Definition and Calculations:

Below are the key measurements of the Queen's Chamber Niche, highlighting its significance.



Passageway Width and Height: Pw

$Pw \ = \ 120 \cdot (sin(\pi/14) \ + \ sin^2\pi/14)) \cdot (cos(5\pi/14) \ - \ sin(5\pi/14) \ + \ 1/2)$

$Pw \ \approx \ 1.0744855636 \, m$

Passageway Vertical Height: Ph

$Ph \ = \ Pw \, / \, cos(\pi/7)$

$Ph \ \approx \ 1.1925890027 \, m$

Passageway Hidden Side: Pb

$Pb \ = \ Pw \cdot tan(\pi/7)$

$Pb \approx 0.5174449757$

Bottom Width of the Niche: Nw

$Nw \ = \ Pw \ + \ Pb$

$Nw \ = \ Pw \ + \ Pw \, / \, cos(\pi/7$

$Nw \ = \ 1.0744855636 \ + \ 0.5174449757$

$Nw \ = \ 1.5919305393 \, meters$

Bottom height of the Niche: Bn

$Bn \ = \ Pb \ + \ Ph$

$Bn \ = \ Pw \cdot tan(\pi/7) \ + \ Pw \, / \, cos(\pi/7$

$B \ = \ 0.5174449757 \ + \ 1.1925890027$

$Bn \ = \ 1.7100339784 \, meters$

Height of Corbel 1: h1

$h1 \ = \ Bn \, / \, 2$

$h1 \ = 1.7100339784 \ / \ 2$

$h1 \ = 0.8550169892 \ meters$

Height of Queen's Chamber: Qh

- **Upper part of Queen's chamber: Up**

$b \ = Pw \cdot tan(\pi/7) \approx 0.5174449757$

$Up \ = 9b$

$Up = 9 \cdot Pw \cdot tan(\pi/7)$

$Up = 4.6570047814 \ meters$

- **Bottom height: B**

$B \ = 1.7100339784 \ meters$

- **Adjustment value: ad**

$a \ = \ 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$a \ \approx 1.0744855636 \ m$

$ad \ = B \ / \ 2$

$ad \ = 1.0744855636 \ / \ 8$

$ad \ = 0.1343106955 \ meters$

- **Height of Queen's chamber: Qh**

$Qh = Up + \ B \ - ad$

$Qh = 4.6570047814 + 1.7100339784 \ - 0.1343106955$

$Qh = 6.2327280644 \ meters$

Height of the Niche: Nh

- **This is the Apex height portion of the Queen's chamber: Ah**

$b = Pw \cdot tan(\pi/7) \approx 0.5174449757$

$Ah = 3b$

$Ap = 3 \cdot Pw \cdot tan(\pi/7)$

$Ap = 1.5523349271\ meters$

- **Height of the Niche: Nh**

$Nh = Qh - Ap$

$Nh = 6.2327280644 - 1.5523349271$

$Nh = 4.6803931372\ meters$

Upper height part of the Niche: Un

- **Bottom niche: Bn**

$Bn = 1.7100339784$

- **Upper niche: Un**

$Up = 4.6803931372 - 1.7100339784$

$Up = 2.9703591588\ meters$

Corbel 2, 3, 4 heights:

- **Height of Corbel 1: h1**

$h1 = 0.8550169892\ meters$

- **Upper niche: Un**

$Up = 2.9703591588\ meters$

- **Height of Corbel 2, 3, 4: h2**

$h2 = (Up - h1) / 3$

$h2 = (2.9703591588 - 0.8550169892) / 3$

$h2 = 0.7051140565\ meters$

Width of Corbels: w1, w2, w3, w4

- Passageway width: Pw

$Pw = 120 \cdot (sin(\pi/14) + sin^2 \pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$Pw \approx 1.0744855636\ m$

- Adjustment value: ad

$ad = 0.1343106955\ meters$

- Passageway width: b

$b = Pw \cdot tan(\pi/7)$

$b \approx 0.5174449757$

- Niche width: Nw

$Nw = 1.0744855636 + 0.5174449757$

$Nw \approx 1.5919305393\ meters$

- Corbel 1 width: w1

$w1 = Nw - (2 \cdot ad)$

$w1 = 1.5919305393 - (2 \cdot 0.1343106955)$

$w1 \approx 1.3233091484\ meters$

- Corbel 2 width: w2

$w2 = w1 - (2 \cdot ad)$

$w2 \approx 1.0546877575\ meters$

- Corbel 3 width: w3

$w3 = w2 - (2 \cdot ad)$

$w3 \approx 0.7860663666\, meters$

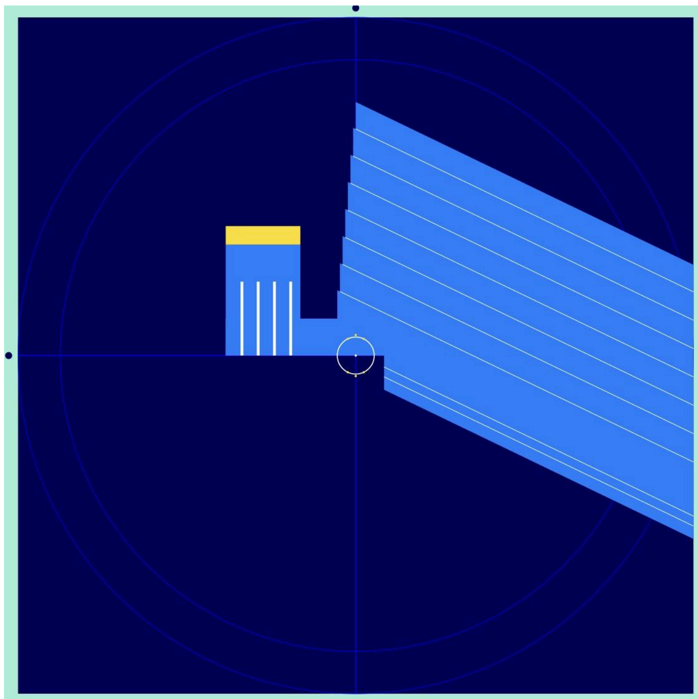
- **Corbel 4 width: w4**

$w4 = w3 - (2 \cdot ad)$

$w4 \approx 0.5174449757\, meters$

44. Grand Gallery

The Grand Gallery, the largest area within the Great Pyramid, has long intrigued researchers with its enigmatic nature. It is our privilege to offer insights that may one day contribute to the restoration of this space to its former splendor.



Grand Gallery:

Grand Gallery	Meters	Feet
Width	2.1489711272	7.0504302075
Corridor width	1.0744855636	3.5252151037
Roof width	1.0744855636	3.5252151037
East ledge width	0.5372427818	1.7626075519

West ledge width	0.5372427818	1.7626075519
Corbel width	0.0767489688	0.2518010788
Height	8.5958845089	28.2017208299
Corbel starting level	2.2947069646	7.5285661569
Height of the Great Step	38.2882978576	125.6177751233

Diagonal	Radian	Radian	Degree
Angle A	$\pi/7$	0.4487989505	25.7142857143
Angle B	$5\pi/14$	1.1219973763	64.2857142857
Angle C	$\pi/2$	$\pi/2$	90

Definition and Calculations:

Outlined below are the crucial measurements of the Grand Gallery, underscoring its importance within the structure of the Great Pyramid.

Given:

$a = QB\ radius \approx 10.7068760368\ m$

$a = 60 \cdot (sin\ \pi/14)) \cdot \ (2 \cdot sin\ 5\pi/14 - 1)$

$b = QB\ radius\ 2 \approx 13.0893800922\ m$

$c = KC\ radius \approx 11.5857857828\ m$

$c = 120 \cdot (sin\ \pi/14) \cdot \ (cos\ 5\pi/14)$

$d = KB\ radius\ 2 \approx 14.1638656558\ m$

width:

$a = KB\ radius\ 2 \approx 14.1638656558\ m$

$b = QB\, radius\, 2 \approx 13.0893800922\, m$

$c = width$

$c = 2 \cdot (a - b)$

$c = width \approx 2.1489711272\, m$

Corridor width:

$a = KB\, radius\, 2 \approx 14.1638656558\, m$

$b = QB\, radius\, 2 \approx 13.0893800922\, m$

$c = CW\, width$

$c = a - b$

$c \approx 1.0744855636\, meters$

$c = CW\, width \approx 1.0744855636\, m$

Ascending passageway height:

$c = CW\, width \approx 1.0744855636\, m$

$height = c \cdot (cos\, \pi/7)$

$height \approx 1.1925890027\, meters$

$height \approx 3.9126935783\, feet$

Roof width:

$a = KB\, radius\, 2 \approx 14.1638656558\, m$

$b = QB\, radius\, 2 \approx 13.0893800922\, m$

$c = CW\, width$

$c = a - b$

$c \approx 1.0744855636\, meters$

$c = CW\, width \approx 1.0744855636\, m$

East ledge width:

$a = width \approx 1.0744855636\, m$

$b = EL\, width$

$b = a / 2$

$b \approx 0.5372427818\, m$

$b = EL\, width \approx 0.5372427818\, m$

West ledge width:

$a = width \approx 1.0744855636\, meters$

$b = WL\, width$

$b = a / 2$

$b \approx 0.5372427818\, m$

$b = WL\, width \approx 0.5372427818\, m$

Corbel width:

$a = WL\, width \approx 0.5372427818\, m$

$b = CL\, width$

$b = a / 7$

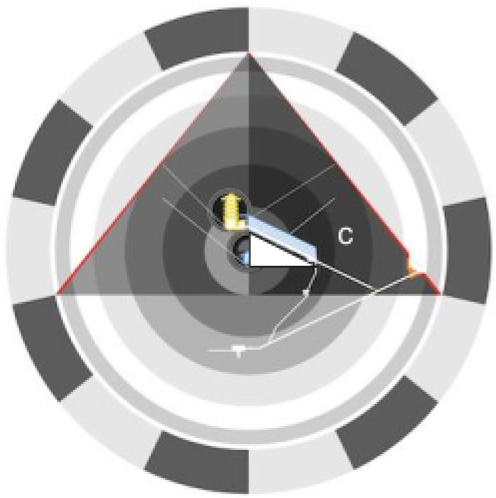
$b \approx 0.0767489688\, meters$

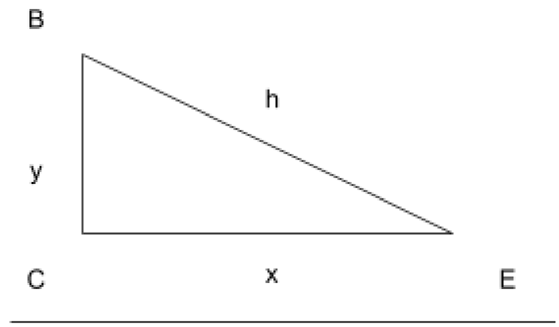
$b = WL\, width \approx 0.0767489688\, m$

length:

$a = QB\, radius \approx 10.7068760368\, m$

$b = QB\, radius\, 2 \approx 13.0893800922\, m$





angle:

$A = 2\pi/7$

$B = (\pi - 2\pi/7) / 2$

$B = 5\pi/14$

$E = \pi/2 - 5\pi/14$

$E = angle = \pi/7$

Great step height from the ground:

$a = pyramid\ center\ height = 120 \cdot (sin\, \pi/14) = 26.7025120748$

$b = a \cdot (cos\, 5\pi/14)$

$b = 120 \cdot (sin\, \pi/14) \cdot (cos\, 5\pi/14) = 11.5857857828\ Meters$

$height = a + b$

$height = 120 \cdot (sin\, \pi/14) + (120 \cdot (sin\, \pi/14) \cdot (cos\, 5\pi/14))$

$height = 120 \cdot sin\, \pi/14 \cdot (1 + (cos\, 5\pi/14))$

$height \approx 38.2882978576\ Meters$

Queen Chamber radius:

$a = QB\ radius \approx 10.7068760368\ m$

$b = pyramid\ center\ height = 120 \cdot (sin\,\pi/14) = 26.7025120748$

$c = 120 \cdot (sin\,\pi/14)) \cdot (sin\,5\pi/14) = 24.0581320741$

$d = 120 \cdot (sin\,\pi/14))/2 = 13.3512560374$

$d = 60 \cdot sin\,\pi/14 = 13.3512560374$

$a = c - d$

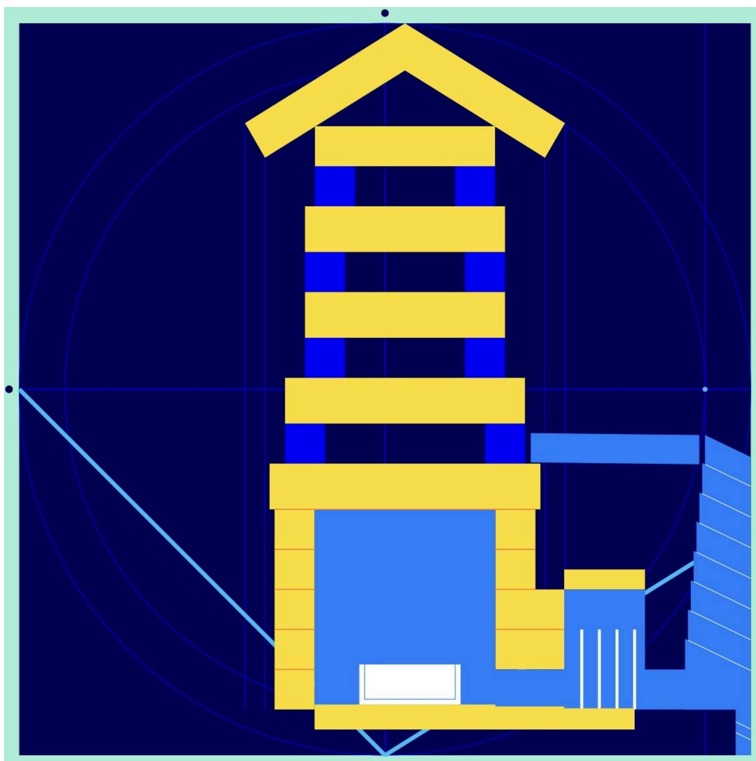
$a = 120 \cdot (sin\,\pi/14)) \cdot (sin\,5\pi/14) - 60 \cdot sin\,\pi/14$

$a = 60 \cdot (sin\,\pi/14)) \cdot (2 \cdot sin\,5\pi/14 - 1)$

$a = 10.7068760368\ Meters$

45. King's Chamber

The King's Chamber is the most iconic part of the Great Pyramid. Knowing its dimensions is paramount to understanding the overall design of the Pyramid. This section addresses the key questions concerning the King's Chamber: its width, height, length, the pinnacle to the relieving chambers, the slope of the pinnacle, and its width, height, and length.



Definition and Calculations:

The dimensions of a third pyramid that accompanies any Great Pyramid at any scale can be calculated using the formulas given here, below:

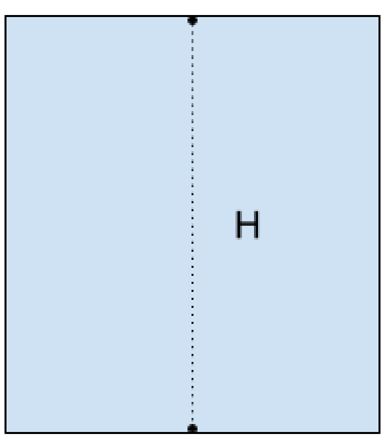
King’s Chamber	Meters	Feet
Height	5.8064076222	19.0498937736
Width	5.2381171226	17.1854236307
Length	10.4634124036	34.3287808518
Hypotenuse (H-W)	7.8199897996	25.6561345131
Hypotenuse (H-L)	11.9665102935	39.2602043749

Angles of elevation of the king’s shafts:

Inside the King’s Chamber, there are two shafts. While many believe these shafts were intended for ventilation, their true purpose remains a mystery.

King’s Shafts	Radians	Radians	Degrees
North Shaft A	$tan^{-1}\left(\frac{1 - sin\,\pi/14}{1 + sin\,\pi/14}\right)$	0.5664445808	32.4548838093
North Shaft B	$tan^{-1}\left(\frac{1 + sin\,\pi/14}{1 - sin\,\pi/14}\right)$	1.0043517460	57.5451161907
South Shaft	$\pi/4$	0.7853981634	45

Height of the King’s Chamber: Ky



$$Pb = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot tan(\pi/7)$$

$$Pb \approx 0.5174449757$$

$$Pw = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$Pw \approx 1.0744855636\, m$$

$$Kh = 12 \cdot Pb - 3 \cdot (Pw/8)$$

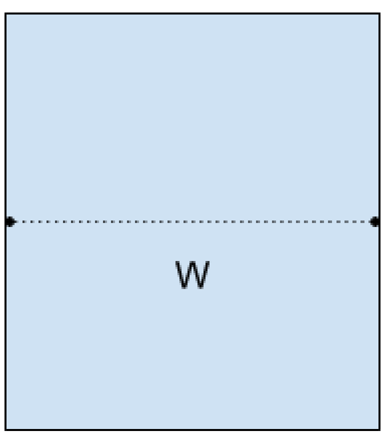
$$Kh = 5.8064076222\, meters$$

Formula for the Height of King's Chamber: Kh

$$Kh = 45 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot (32 \cdot tan(\pi/7) - 1)$$

$$Kh = 5.8064076222\, meters$$

Width of the King's Chamber: Kw



$$Pw = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$sh = Pw/2$$

$$sh = 60 \cdot (sin(\pi/14) + sin^{2}\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$sh = great\ step\ shift \approx 0.5395810861\ meters$$

$$ad = Pw / 8$$

$$ad = 15 \cdot (sin(\pi/14) + sin^{2}\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$ad = 0.1343106955\ meters$$

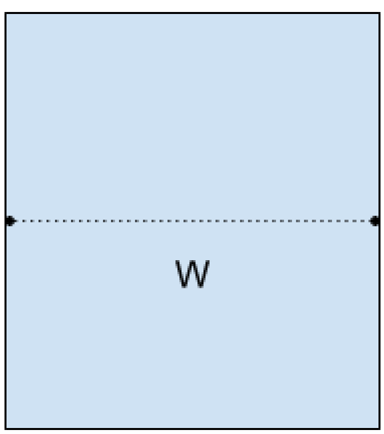
$$Kw = 10 \cdot sh - ad$$

$$Kw = 10 \cdot Pw/2 - Pw / 8$$

$$Kw = 585 \cdot (sin(\pi/14) + sin^{2}\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$Kw = 5.2381171226\ meters$$

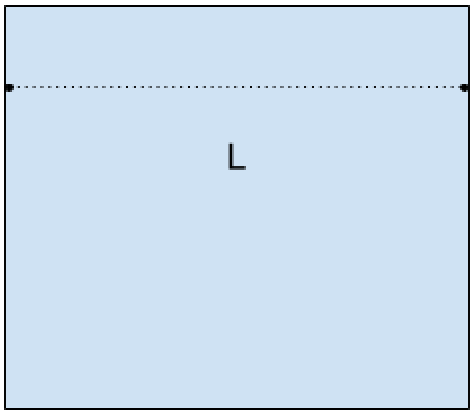
Formula for the width of King's Chamber: Kw

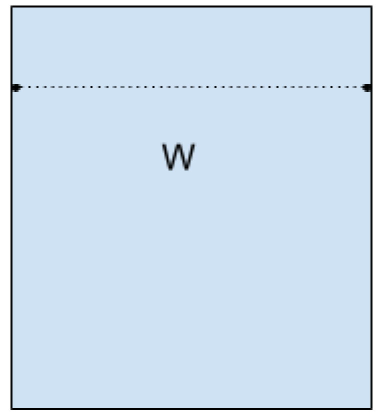


$$Kw = 585 \cdot (sin(\pi/14) + sin^{2}\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$Kw = 5.2381171226\ meters$$

Length of the King's Chamber: Kl





$$Pb = 120 \cdot (sin(\pi/14) + sin^{2}\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot tan(\pi/7)$$

$$Pb \approx 0.5174449757$$

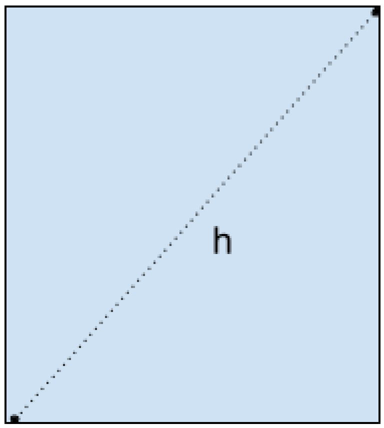
$$Pw = 120 \cdot (sin(\pi/14) + sin^{2}\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$Pw \approx 1.0744855636\, m$$

$$Kl = 21 \cdot Pb - 3 \cdot (Pw/8)$$

$$Kl = 10.4634124036\, meters$$

Hypotenuse of the King's Chamber: h



Formula for the Height of King's Chamber: Kh

$$Kh = 45 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot (32 \cdot tan(\pi/7) - 1)$$

$$Kh = 5.8064076222\ meters$$

Formula for the width of King's Chamber: Kw

$$Kw = 585 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$Kw = 5.2381171226\ meters$$

Formula for the Hypotenuse of the King's Chamber: h

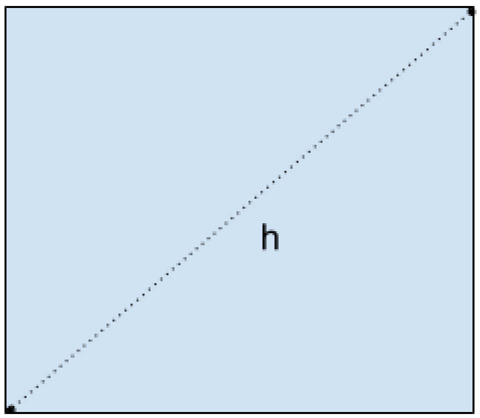
$$Kh = a$$

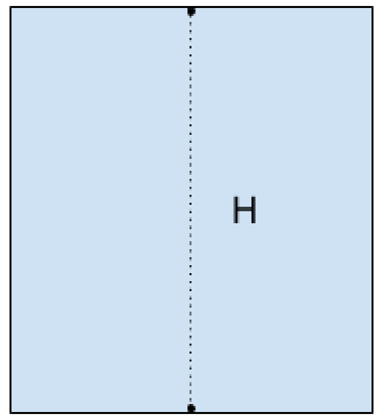
$$Kw = b$$

$$h = \sqrt{a^2 + b^2}$$

$$h = 7.8199897996\ meters$$

Hypotenuse of the King's Chamber: h





Formula for the Height of King's Chamber: Kh

$$Kh = 45 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot (32 \cdot tan(\pi/7) - 1)$$

$$Kh = 5.8064076222\ meters$$

Length of the King's Chamber: Kl

$$Kl = 21 \cdot Pb - 3 \cdot (Pw/8)$$

$$Kl = 10.4634124036\ meters$$

Formula for the Hypotenuse of the King's Chamber: h

$$Kh = a$$

$$Kl = b$$

$$h = \sqrt{a^2 + b^2}$$

$$h = 11.9665102935\ meters$$

Angles of elevation of the king's shafts:

The two shafts of the King's Chamber rise at different angles. In this section, we will outline the method for calculating these angles.

Definition and Calculations:

$South\ Shaft\ Angle\ = \pi/4$

$North\ Shaft\ Angle\ = tan^{-1}\left(\frac{1 - sin\ \pi/14}{1 + sin\ \pi/14}\right)$

$North\ Shaft\ Angle\ = tan^{-1}\left(\left(sec\ \pi/14\ -\ tan\ \pi/14\right)^{2}\right)$

Angle of the south shaft:

Given:

$unit\ circle$

$dodecagon$

$point\ A\ =\ \pi/2$

$point\ E\ =\ -\ \pi/14$

Next Pyramid:

$\theta\ =\ of\ the\ south\ shaft$

$\theta\ =\ \pi/4$

$\theta\ \approx\ 0.7853981634\ rad$

Definition and Calculations: Angle of the north shaft:

$North\ Shaft\ Angle\ = tan^{-1}\left(\frac{1 - sin\ \pi/14}{1 + sin\ \pi/14}\right)$

$North\ Shaft\ Angle = tan^{-1}\left((sec\ \pi/14 - tan\ \pi/14)^2 \right)$

Given:

$unit\ circle$

$dodecagon$

$Radius\ of\ circle\ 7 = sin\ \pi/14$

Center of king chamber design radius:

Adjacent side:

$hypotenuse = sin\ \pi/14$

$Angle = 5\pi/14$

$cos\ \theta = \frac{adjacent}{hypotenuse}$

$adjacent = hypotenuse \cdot (cos\ 5\pi/14)$

$adjacent = (sin\ \pi/14) \cdot (cos\ 5\pi/14)$

Opposite side:

$sin\ \theta = \frac{opposite}{hypotenuse}$

$opposite = hypotenuse \cdot (sin\ 5\pi/14)$

$opposite = (sin\ \pi/14) \cdot (sin\ 5\pi/14)$

Radius 6 of the unit circle:

$radius = cos\ 5\pi/14$

At angle 45 degrees:

$Angle = \pi/4$

$opposite\ =\ cos\,5\pi/14$

$adjacent\ =\ cos\,5\pi/14$

$hypotenuse\ =\sqrt{2}\cdot\ cos\,5\pi/14$

Triangle at point of intersection of the king's shafts:

$opposite\ =\ cos\,5\pi/14\ -\ (sin\,\pi/14)\ \cdot\ (cos\,5\pi/14)$

$adjacent\ =\ cos\,5\pi/14\ +\ (sin\,\pi/14)\ \cdot\ (cos\,5\pi/14)$

$tan\,\theta\ =\frac{cos\,5\pi/14-(sin\,\pi/14)\cdot(cos\,5\pi/14)}{cos\,5\pi/14+(sin\,\pi/14)\cdot(cos\,5\pi/14)}$

$tan\,\theta\ =\frac{cos\,5\pi/14\cdot(1-sin\,\pi/14)}{cos\,5\pi/14\cdot(1+sin\,\pi/14)}$

$tan\,\theta\ =\frac{1-sin\,\pi/14}{1+sin\,\pi/14}$

$\theta\ =tan^{-1}\,(\frac{1-sin\,\pi/14}{1+sin\,\pi/14})$

$\theta\ =tan^{-1}\,(\,(sec\,\pi/14\ \ -\ tan\,\pi/14)^{2})$

$\theta\ \approx\ 0.5664445808\,rad$

Facts:

$(cos\,\theta)^{2}+\ (sin\,\theta)^{2}=\ 1$

$(cos\,\theta)^{2}=\ 1\ -\ (sin\,\theta)^{2}$

$\frac{(1-a)\cdot(1-a)}{(1+a)\cdot(1-a)}\ =\frac{1-2a+a^{2}}{1-a^{2}}$

Therefore:

$\frac{1-sin\,\pi/14}{1+sin\,\pi/14}$

$\frac{1-sin\,\pi/14}{1+sin\,\pi/14}\cdot\frac{1-sin\,\pi/14}{1-sin\,\pi/14}$

$\frac{1-2\cdot sin\,\pi/14+(sin\,\pi/14)^{2}}{1-(sin\,\pi/14)^{2}}=\frac{1-2\cdot sin\,\pi/14+(sin\,\pi/14)^{2}}{(cos\,\pi/14)^{2}}$

$$\frac{1}{(\cos \pi/14)^{2}} - 2\left(\frac{\sin \pi/14}{\cos \pi/14}\right) \cdot \frac{1}{\cos \pi/14} + \frac{(\sin \pi/14)^{2}}{(\cos \pi/14)^{2}}$$

$$(\sec \pi/14)^{2} - 2 \cdot \tan \pi/14 \cdot \sec \pi/14 + (\tan \pi/14)^{2}$$

$$(\sec \pi/14)^{2} - 2 \cdot \sec \pi/14 \cdot \tan \pi/14 + (\tan \pi/14)^{2}$$

$$(\sec \pi/14 - \tan \pi/14)^{2}$$

$$\frac{1 - \sin \pi/14}{1 + \sin \pi/14} = (\sec \pi/14 - \tan \pi/14)^{2}$$

💡 *New Identity for modern Trigonometry:*

$$\frac{1 - \sin \theta}{1 + \sin \theta} = (\sec \theta - \tan \theta)^{2}$$

46. Distance Between Pyramids

It is time to elucidate the criteria employed in the arrangement of the three pyramids of Giza, Egypt. The distances between these pyramids have long been a mystery that has captivated humanity for centuries. Speculation has ranged from alignments with celestial bodies to various other theories. In this section, we introduce a novel criterion based on insights gleaned from the information presented in this document.

Distance Between Pyramids:

Distance Between	Meters	Feet
Pyramids 1 and 2 centers	507. 2696142849	1, 664. 2703880738
Pyramids 1 and 2 corners	188. 9193741240	619. 8142195671
Pyramids 2 and 3 centers	522. 8815500907	1, 715. 4906499040
Pyramids 2 and 3 corners	307. 2323776918	1, 007. 9802417711
Pyramids 1 and 3 centers	1, 022. 4345945612	3, 354. 4442078780
Pyramids 1 and 3 corners	784. 8691384065	2, 575. 0299816486

Center-to-center distance between 1st and 2nd Pyramids:

$d = 240\sqrt{2} \cdot (1 + sin(\pi/14))^2$

$d = 507.2696142849\ meters$

Corner-to-corner distance between 1st and 2nd Pyramids:

$d = 120\sqrt{2} \cdot (2 \cdot (1 + sin(\pi/14))^2 - sin(5\pi/14) - cos(\pi/14))$

$d = 188.9193741240\ meters$

Center-to-center distance between 2nd and 3rd Pyramids:

$a = 180 \cdot (1 + sin(\pi/14))^2$

$b = 300 \cdot (1 + sin(\pi/14))^2$

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

$c = 522.8815500907\ meters$

$c = 1,715.4906499040\ feet$

Corner-to-Corner distance between 2nd and 3rd Pyramids:

$(c_2)^2 = (a_2)^2 + (b_2)^2$

$c_2 = 307.2323776918\ meters$

$c_2 = 1,007.9802417711\ feet$

Center-to-center distance between 1st and 3rd Pyramids:

$a = 420 \cdot (1 + sin(\pi/14))^2$

$b = 540 \cdot (1 + sin(\pi/14))^2$

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

$c = 1,022.4345945612\ meters$

$c = 3,354.4442078780\ feet$

Corner-to-Corner distance between 1st and 3rd Pyramids:

$(c_3)^2 = (a_3)^2 + (b_3)^2$

$c_3 = 784.8691384065\ meters$

$c_3 = 2,575.0299816486\ feet$

Definition and Calculations:

Outlined below are the formulas and criteria utilized in this section to validate the figures presented.

Pyramid 1	Meters	Feet
Height	146.7025120748	481.3074543135
Sidelength	116.9913494618	383.8298866858
Width	233.9826989236	767.6597733715
Diagonal Sidelength	165.4507530892	542.8174313951
Total Dia. Sidelength	330.9015061785	1,085.6348627903

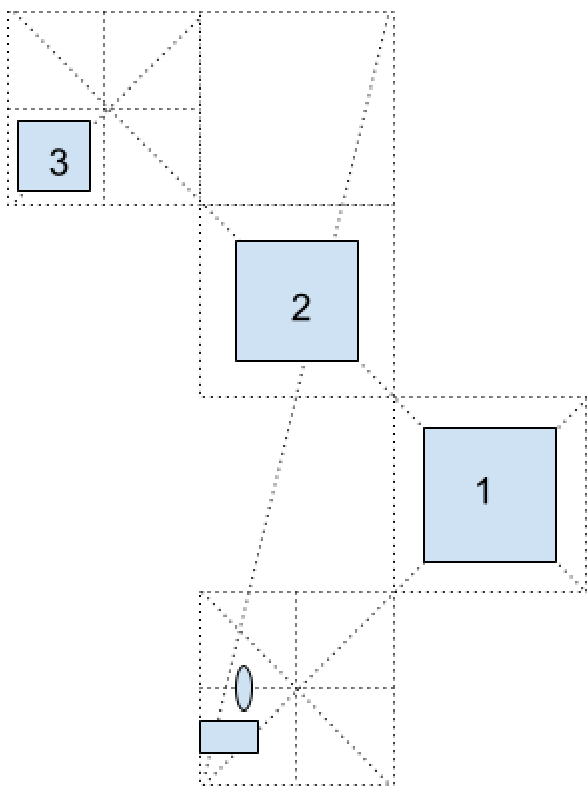
Pyramids 2

Dimensions	Meters	Feet
Height	143.6938615366	471.4365535977
Sidelength	108.116264148	354.7121527175
Width	216.2325282966	709.4243054350

Diagonal Sidelength	152. 8994870716	501. 6387371116
Total Dia. Sidelength	305. 7989741432	1, 003. 2774742233

Pyramids 3

Dimensions	Meters	Feet
Height	66. 0867924592	216. 8201852336
Sidelength	52. 7024583428	172. 9083278963
Width	105. 4049166856	345. 8166557926
Diagonal Sidelength	74. 5325313588	244. 5293023582
Total Dia. Sidelength	149. 0650627176	489. 0586047165



Fourth iteration Information:

$h = r \cdot \Lambda$

$\Lambda = 1 + sin(\pi/14)$

$\Lambda \approx 1.2225209340$

$r = 120 \cdot \Lambda = 146.7025120748 \cdot (1 + sin(\pi/14)) = 179.3468920754$

$Circle = r \cdot abs(sin\,\theta)$

$Circle = A \cdot sin(\pi/2) = 179.3468920754$

$r = 120 \cdot (1 + sin(\pi/14)) \cdot (1 + sin(\pi/14)) = 179.3468920754$

$r = 120 \cdot (1 + sin(\pi/14))^2 = 179.3468920754$

$Pyramid\ 4th\ Height = 219.2553300021\ meters$

$radius\ one = 179.3468920754\ meters$

$sidelength \approx 174.8502910473\ meters$

$Lateral\ sidelength \approx 247.2756529840\ meters$

Fourth iteration Square:

$Circle = A \cdot sin(\pi/2) = 179.3468920754$

$h \approx 216.2325282966$

$h = width \approx 216.2325282966\ meters$

$h = width \approx 709.4243054350\ feet$

Diagonal sidelength of the base:

$i = e \cdot \sqrt{2}$

$i = lateral\ sidelength$

$e = sidelength \approx 179.346892075\ meters$

$e = 120 \cdot (1 + sin(\pi/14))^2 = 179.3468920754$

$i = 179.3468920754 \cdot \sqrt{2}$

$i \approx 253.6348071425\ meters$

$i \approx 253.6348071425\ meters$

$i = 120 \cdot \sqrt{2} \cdot (1 + sin(\pi/14))^2 = 253.6348071425\ meters$

Center-to-center distance between 1st and 2nd Pyramids:

Part 1:

$a = 1st\ Py\ lateral\ sidelength$

$b = 1st\ Py\ square\ Diagonal\ Sidelength$

$a = 120 \cdot (1 + sin(\pi/14))^2$

$b = \sqrt{2} \cdot a$

$b = \sqrt{2} \cdot 120 \cdot (1 + sin(\pi/14))^2$

$b = 120 \cdot \sqrt{2} \cdot (1 + sin(\pi/14))^2$

Part 2:

$c = 2 \cdot b$

$c = 2 \cdot (120 \cdot \sqrt{2} \cdot (1 + sin(\pi/14))^2)$

$c = 240 \cdot \sqrt{2} \cdot (1 + sin(\pi/14))^2$

$c = 507.2696142849\ meters$

$c = 1,664.2703880738\ feet$

Corner-to-corner distance between 1st and 2nd Pyramids:

Part 1:

$a = 2nd\ Py\ Sidelength$

$b = 2nd\ Py\ Diagonal\ Sidelength$

$a = 120 \cdot sin(5\pi/14$

$b = \sqrt{2} \cdot a$

$b = \sqrt{2} \cdot (120 \cdot sin(5\pi/14)$

$b = 120 \cdot \sqrt{2} \cdot sin(5\pi/14)$

Part 2:

$c = 1st\ Py\ Sidelength$

$d = 1st\ Py\ Diagonal\ Sidelength$

$c = 120 \cdot cos(\pi/14)$

$e = \sqrt{2} \cdot c$

$e = \sqrt{2} \cdot 120 \cdot cos(\pi/14)$

$e = 120 \cdot \sqrt{2} \cdot cos(\pi/14)$

Part 3:

$c = 1st\ Py\ Square\ Diagonal\ Sidelength$

$c = 120 \cdot \sqrt{2} \cdot (1 + sin(\pi/14))^2$

$f = 2 \cdot c$

$f = 2 \cdot 120 \cdot \sqrt{2} \cdot (1 + sin(\pi/14))^2$

$f = 240 \cdot \sqrt{2} \cdot (1 + sin(\pi/14))^2$

Distance e:

$g = f - b - e$

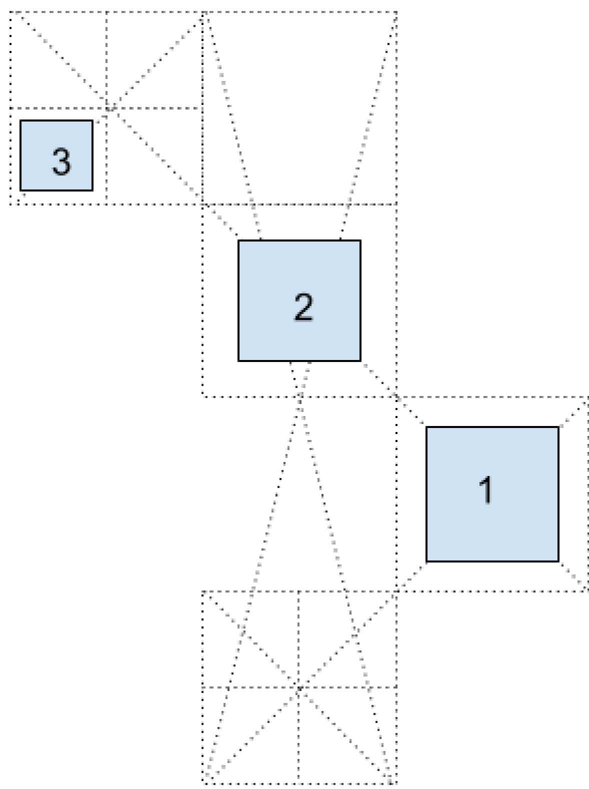
$g = 240 \cdot \sqrt{2} \cdot (1 + sin(\pi/14))^2 - 120 \cdot \sqrt{2} \times sin(5\pi/14) - 120 \cdot \sqrt{2} \cdot cos(\pi/14)$

$g = 120 \cdot \sqrt{2} \cdot (2 \cdot (1 + sin(\pi/14))^2 - sin(5\pi/14) - cos(\pi/14))$

$g = 188.9193741240\ meters$

$g = 619.8142195671\ feet$

Center-to-center distance between 2nd and 3rd Pyramids (b) :



Fourth iteration Information:

$h = r \cdot \Lambda$

$\Lambda = 1 + sin(\pi/14)$

$\Lambda \approx 1.2225209340$

$r = 120 \cdot (1 + sin(\pi/14))^2 = 179.3468920754$

Part 1:

$r = 120 \cdot (1 + sin(\pi/14))^2$

$a = r + r/2$

$a = 3r/2$

$a = 3 \cdot \left(\frac{120 \cdot (1 + sin(\pi/14))^2}{2}\right)$

$a = 180 \cdot (1 + sin(\pi/14))^2$

Part 2:

$b = r + r + r/2$

$b = 5r/2$

$b = 5 \cdot \left(\frac{120 \cdot (1 + sin(\pi/14))^2}{2}\right)$

$b = 300 \cdot (1 + sin(\pi/14))^2$

Center-to-center distance between 2nd and 3rd Pyramids:

$a = 180 \cdot (1 + sin(\pi/14))^2$

$b = 300 \cdot (1 + sin(\pi/14))^2$

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

$c = 522.8815500907\ meters$

$c = 1,715.4906499040\ feet$

Corner-to-Corner distance between 2nd and 3rd Pyramids:

$a_2 = \ ?$

$b_2 = \ ?$

$\left(c_2\right)^2 = \left(a_2\right)^2 + \left(b_2\right)^2$

Pyramid 2 sidelength:

$sidelength \ = \ 120 \ \cdot \ sin(5\pi/14)$

$f_1 = \ 120 \ \cdot \ sin(5\pi/14)$

$f_1 \approx \ 108.1162641483 \ meters$

Pyramid 3 Outer sidelength:

$sidelength \ = \ (60 \ \cdot \ cos(5\pi/14) \ + \ 180 \ \cdot \ sin(\pi/14)) \ / \ tan(2\pi/7)$

$f_2 = \ (60 \ \cdot \ cos(5\pi/14) \ + \ 180 \ \cdot \ sin(\pi/14)) \ / \ tan(2\pi/7)$

$f_2 \approx \ 52.7024583428$

Getting a_2

$a \ = \ 180 \ \cdot \ (1 \ + sin(\pi/14))^2$

$f_1 = \ 120 \ \cdot \ sin(5\pi/14)$

$f_2 = \ (60 \ \cdot \ cos(5\pi/14) \ + \ 180 \ \cdot \ sin(\pi/14)) \ / \ tan(2\pi/7)$

$a_2 = \ a - f_1 - f_2$

$a_2 = \ 108.2016156220$

Getting: b_2

$b = 300 \cdot (1 + sin(\pi/14))^2$

$f_1 = 120 \cdot sin(5\pi/14)$

$f_2 = (60 \cdot cos(5\pi/14) + 180 \cdot sin(\pi/14)) / tan(2\pi/7)$

$b_2 = b - f_1 - f_2$

$b_2 = 287.5485076973$

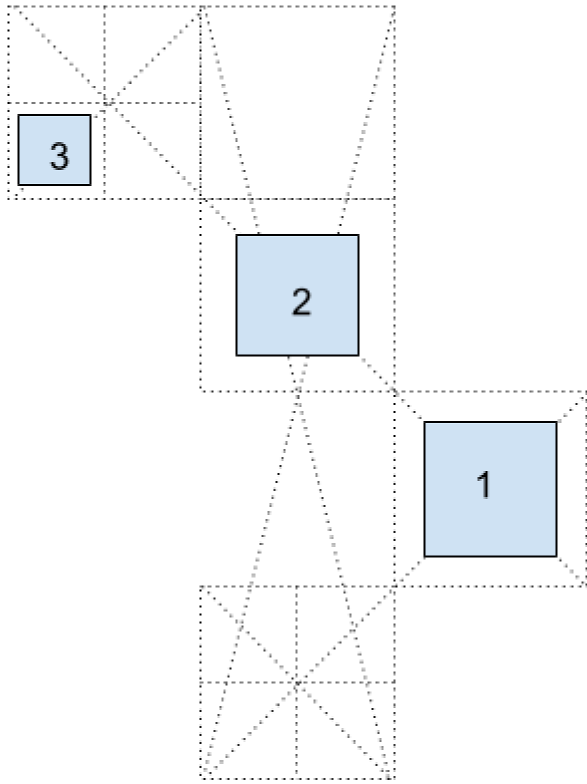
Corner-to-Corner distance between 2nd and 3rd Pyramids:

$(c_2)^2 = (a_2)^2 + (b_2)^2$

$c_2 = 307.2323776918\ meters$

$c_2 = 1,007.9802417711\ feet$

Center-to-center distance between 1st and 3rd Pyramids (b) :



Fourth iteration Information:

$h = r \cdot \Lambda$

$\Lambda = 1 + sin(\pi/14)$

$\Lambda \approx 1.2225209340$

$r = 120 \cdot (1 + sin(\pi/14))^2 = 179.3468920754$

Part 1:

$r = 120 \cdot (1 + sin(\pi/14))^2$

$a = 3r + r/2$

$a = 7r/2$

$$a = 7 \cdot \left(\frac{120 \cdot (1 + sin(\pi/14))^2}{2}\right)$$

$$a = 420 \cdot (1 + sin(\pi/14))^2$$

Part 2:

$$b = 4r + r/2$$

$$b = 9r/2$$

$$b = 9 \cdot \left(\frac{120 \cdot (1 + sin(\pi/14))^2}{2}\right)$$

$$b = 540 \cdot (1 + sin(\pi/14))^2$$

Center-to-center distance between 1st and 3rd Pyramids (b) :

$$a = 420 \cdot (1 + sin(\pi/14))^2$$

$$b = 540 \cdot (1 + sin(\pi/14))^2$$

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

$$c = 1,022.4345945612\ meters$$

$$c = 3,354.4442078780\ feet$$

Corner-to-Corner distance between 1st and 3rd Pyramids :

$$a_3 = ?$$

$$b_3 = ?$$

$$\left(c_3\right)^2 = \left(a_3\right)^2 + \left(b_3\right)^2$$

Pyramid 1 sidelength:

$sidelength = 120 \cdot cos(\pi/14$

$f_0 = 120 \cdot cos(\pi/14))$

$f_0 \approx 116.991349461\, meters$

Pyramid 3 Outer sidelength:

$sidelength = (60 \cdot cos(5\pi/14) + 180 \cdot sin(\pi/14)) / tan(2\pi/7)$

$f_2 = (60 \cdot cos(5\pi/14) + 180 \cdot sin(\pi/14)) / tan(2\pi/7)$

$f_2 \approx 52.7024583428$

Getting a_3

$a = 420 \cdot (1 + sin(\pi/14))^2$

$f_0 = 120 \cdot cos(\pi/14))$

$f_2 = (60 \cdot cos(5\pi/14) + 180 \cdot sin(\pi/14)) / tan(2\pi/7)$

$a_3 = a - f_0 - f_2$

$a_3 = 458.0203144592$

Getting: b_3

$b = 540 \cdot (1 + sin(\pi/14))^2$

$f_0 = 120 \cdot cos(\pi/14))$

$f_2 = (60 \cdot cos(5\pi/14) + 180 \cdot sin(\pi/14)) / tan(2\pi/7)$

$b_3 = b - f_0 - f_2$

$b_3 = 637.3672065345$

Corner-to-Corner distance between 1st and 3rd Pyramids :

$\left(c_3\right)^2 = \left(a_3\right)^2 + \left(b_3\right)^2$

$c_3 = 784.8691384065\ meters$

$c_3 = 2,575.0299816486\ feet$

47. Base Elevation of Pyramid 2:

Pyramid 2 is situated on a base that is significantly higher than that of Pyramid 1. This section introduces a formula to calculate the necessary elevation difference between the bases of any two pyramids—designated as Pyramid 1 and Pyramid 2—when their dimensions are altered. This relationship is crucial for preserving the intended visual effect observed in the original complex, where Pyramid 2 appears larger than Pyramid 1 despite being slightly smaller. Maintaining the correct elevation offset ensures that this optical illusion remains intact under scaled transformations.

Relative Base Elevation and Visual Perception:

Pyramid 2	Meters	Feet
Base elevation	10	32. 8083989501

Definition and Calculations:

$r \ = pyramid\ radius$

$e\ =\ elevation\ of\ pyramid\ 2$

Base Elevation of Pyramid 2:

$r \ = 120$

$e\ =\ r/12$

$e\ =\ 120/12$

$e\ =\ 10\ meters$

$e\ =\ 32.8083989501\ feet$

48. Pathway Constant for the vertical height

The pathway constant for the vertical height is the distance measured from the floor to the roof of the descending or ascending passageway. This value is derived from a complex calculation, which is presented here for reference.

Pathway vertical height constant in the Unit circle

Pathway	Unit Circle Constant	Unit Circle Constant
Vertical height constant	0.0099382417	0.0099382417

Pathway vertical height constant in the Great Pyramid

Pathway	Meters	Feet
Vertical height constant	1.1925890027	3.9126935783

Pathway vertical height constant:

This constant represents the vertical height for both the ascending and descending pathways.

Definition and Calculations:

$constant = 0.0099382417$

$constant = (sec\, \pi/7) \cdot (1 + sin\, \pi/14) \cdot (sin\, \pi/14) \cdot (cos\, 5\pi/14 - sin\, 5\pi/14 + 1 / 2)$

$Height = r \cdot (sec\, \pi/7) \cdot (1 + sin\, \pi/14) \cdot (sin\, \pi/14) \cdot (cos\, 5\pi/14 - sin\, 5\pi/14 + 1 / 2)$

Descending pathway vertical height constant:

$a = width$

$b = hidden\ side$

$height = \sqrt{a^{2} + b^{2}}$

$height = \sqrt{(width)^{2} + (hidden\ side)^{2}}$

$height = \sqrt{((1 + sin\,\pi/14) \cdot (d1))^{2} + ((1 + sin\,\pi/14) \cdot (d1) \cdot tan\,\pi/7)^{2}}$

$height = \sqrt{((1 + sin\,\pi/14) \cdot (d1))^{2} \cdot (1 + tan^{2}\,\pi/7)}$

Fact: $1 + tan^{2}\,\theta = sec^{2}\,\theta$

$height = \sqrt{((1 + sin\,\pi/14) \cdot (d1))^{2} \cdot (sec^{2}\,\pi/7)}$

$height = \sqrt{((1 + sin\,\pi/14) \cdot (d1) \cdot (sec\,\pi/7))^{2}}$

$height = (1 + sin\,\pi/14) \cdot (d1) \cdot (sec\,\pi/7)$

$d1 = (sin\,\pi/14) \cdot (cos\,5\pi/14 - sin\,5\pi/14 + 1\,/\,2)$

$height = (sec\,\pi/7) \cdot (1 + sin\,\pi/14) \cdot ((sin\,\pi/14) \cdot (cos\,5\pi/14 - sin\,5\pi/14 + 1\,/\,2))$

Formula in the unit circle:

$height = (sec\,\pi/7) \cdot (1 + sin\,\pi/14) \cdot (sin\,\pi/14) \cdot (cos\,5\pi/14 - sin\,5\pi/14 + 1\,/\,2)$

$height = 0.0099382417$

Formula in the Great Pyramid:

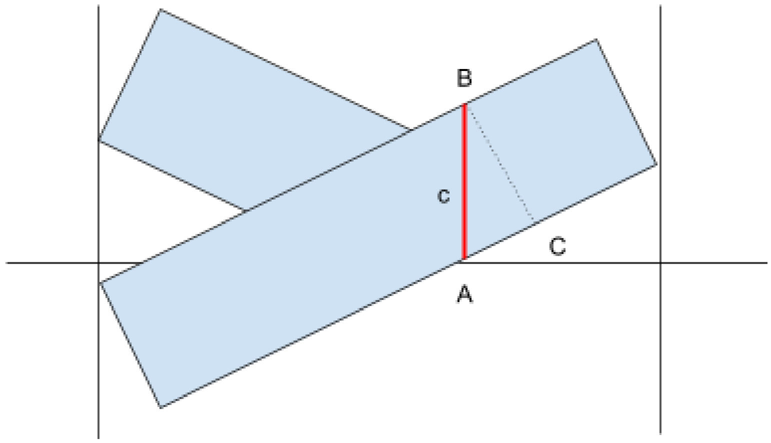
$height = 120 \cdot (sec\,\pi/7) \cdot (1 + sin\,\pi/14) \cdot (sin\,\pi/14) \cdot (cos\,5\pi/14 - sin\,5\pi/14 + 1\,/\,2)$

$height = 1.1925890027\ meters$

Fact:

$1 + tan^{2}\,\theta = sec^{2}\,\theta$

Vertical Height of the passageways:

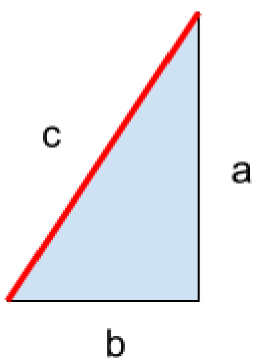


Angle of the Passageways:

$A = \pi/7$

let:

$a = opposite\ side \quad b = Adjacent\ side \quad c = Hypotenuse$



$a = 1.0744855636 \quad b = Adjacent\ side \quad c = Hypotenuse \quad A = \pi/7$

$b = a \cdot tan(\pi/7)$

$c = a\ /\ cos(\pi/7)$

$a \approx 1.0744855636\ m$

$c = a / cos(\pi/7)$

$c \approx 1.1925890027\ m$

49. The Boss of the King's Chamber

The Boss is a mysterious semicircular feature located in the antechamber leading to the King's Chamber from the Grand Gallery of the Great Pyramid. It is one of the few figures discovered inside the pyramid. In this section, we explain how it was designed using the same principles as the pyramid itself. Below, we present a few images to illustrate the design of this symbol found in the antechamber of the King's Chamber.

Image 1: The Design

Image 2: The Design

To generate this image, we use three iterations of the Great Pyramid, nested one inside the other in ascending order. This principle is fundamental to the design of the entire pyramid complex, including the arrangement of the three monuments.

In this section, we include calculations for the original Boss, which measures approximately 30.6996 centimeters in outer width and 20.5409 centimeters in inner width. Since we know the angles, formulas, and proportions of the Boss, it can be easily scaled to any desired size.

Measures of the Boss as positioned in the King's Antechamber:

Dimensions	Centimeters	Inches
Radius 1	10. 2704609520	4. 0434885638
Radius 2 (not visible)	12. 5558535152	4. 9432494154
Radius 3	15. 3497937660	6. 0432258921
Outer Vertical Height	18. 7654442108	7. 3879701617
Inner Vertical Height	12. 5558535152	4. 9432494154
Horizontal Height	2. 4460777637	0. 96302274163
Width of the Brim	5. 0793328140	1. 9997373283
Hypotenuse of the Brim	5. 6376341014	2. 2195409848
Boss outer radius	15. 3497937660	6. 0432258921
Boss outer diameter	30. 6995875319	12. 0864517842
Boss inner radius	10. 2704609520	4. 0434885638
Boss inner diameter	20. 5409219039	8. 0869771275
Endpoint hypotenuse	5. 0793328140	1. 9997373283
Endpoint side x	4. 9519833356	1. 9495997384
Endpoint side y	1. 1302578816	0. 4449834180
Inner base sidelength	10. 0129590530	3. 9421098634
Inner base width	20. 0259181061	7. 8842197268
Outer base sidelength	14. 9649423887	5. 8917096018
Outer base width	29. 9298847774	11. 7834192037
Outer Center from base	2. 7939402508	1. 0999764767
Inner Center from base	1. 8694097579	0. 7359880937

Angles of the Boss:

Angle	Radian	Radian	Degree
Endpoint Angle	$\pi/14$	0.2243994753	12.8571428571
Complement	$3\pi/7$	1.3463968515	77.1428571429
Rim angle	$\pi/7$	0.4487989505	25.7142857143
Complement	$5\pi/14$	1.1219973763	64.2857142857
Base angle	$tan^{-1}(\frac{tan\,\pi/7}{sin\,\pi/14})$	1.1379508728	65.1997823044
Complement	$tan^{-1}(\frac{sin\,\pi/14}{tan\,\pi/7})$	0.4328454540	24.8002176956

Definition and Calculations:

Outlined below are the formulas and criteria utilized in this section to validate the figures presented.

Given:

Width of the Passageways: w

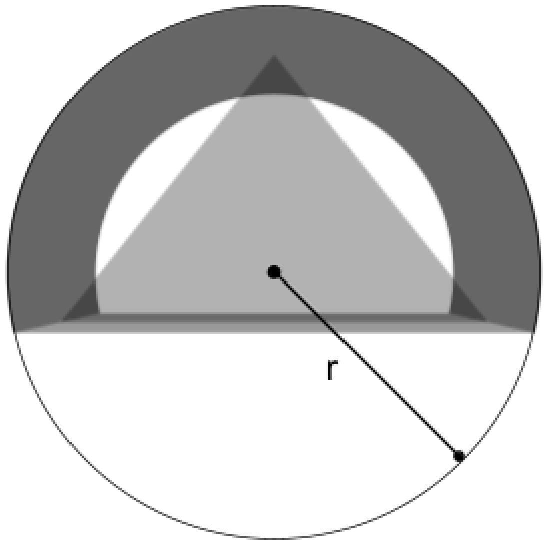
$$w = 120 \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$w = 1.0744855636\,m$$

$$w = 3.5252151037\,feet$$

Then:

The Boss' outer pyramid radius and diameter: Radius 3: c and D



Radius 3:

$c = w/7$

$c = (120/7) \cdot (sin(\pi/14) + sin^2 \pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

Diameter:

$D = 2 \cdot c$

$D = 2 \cdot (120/7) \cdot (sin(\pi/14) + sin^2 \pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$c = 0.1534979377\ m$

$c = 15.3497937660\ cm$

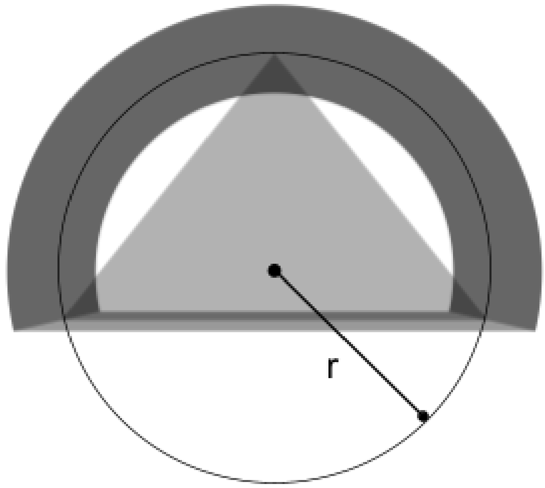
$c = 6.0432258921\ in$

$D = 0.3069958753\ m$

$D = 30.6995875319\ cm$

$D = 12.0864517842\ in$

The Boss' hidden middle pyramid radius and diameter: Radius 2: b and D



Radius 2:

$b = c \div (1 + sin(\pi/14))$

$b = (120/7) \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \div (1 + sin(\pi/14))$

$b = (120/7) \cdot (sin(\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$D = 2 \cdot (120/7) \cdot (sin(\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

Diameter:

$D = 2 \cdot b$

$b = 0.1255585352\, m$

$b = 12.5558535152\, cm$

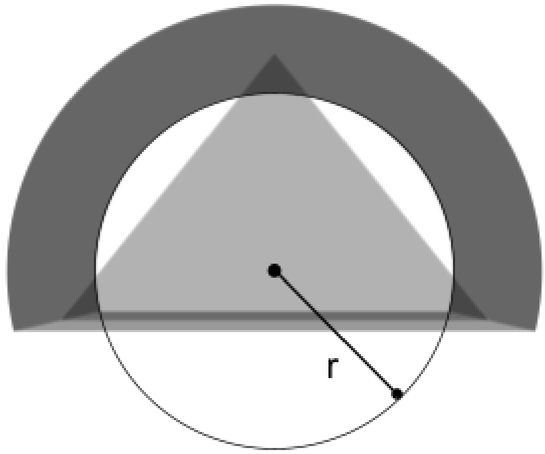
$b = 4.9432494154\, in$

$D = 0.2511170703\, m$

$D = 25.1117070303\, cm$

$D = 9.8864988308\, in$

The Boss inner pyramid radius and diameter: Radius 1: a and D



Radius 1:

$a = b \div (1 + sin(\pi/14))$

$a = (120/7) \cdot (sin(\pi/14) + sin^2 \pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \div (1 + sin(\pi/14))^2$

$a = (120/7) \cdot (sin(\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \div (1 + sin(\pi/14))$

Diameter:

$D = 2 \cdot a$

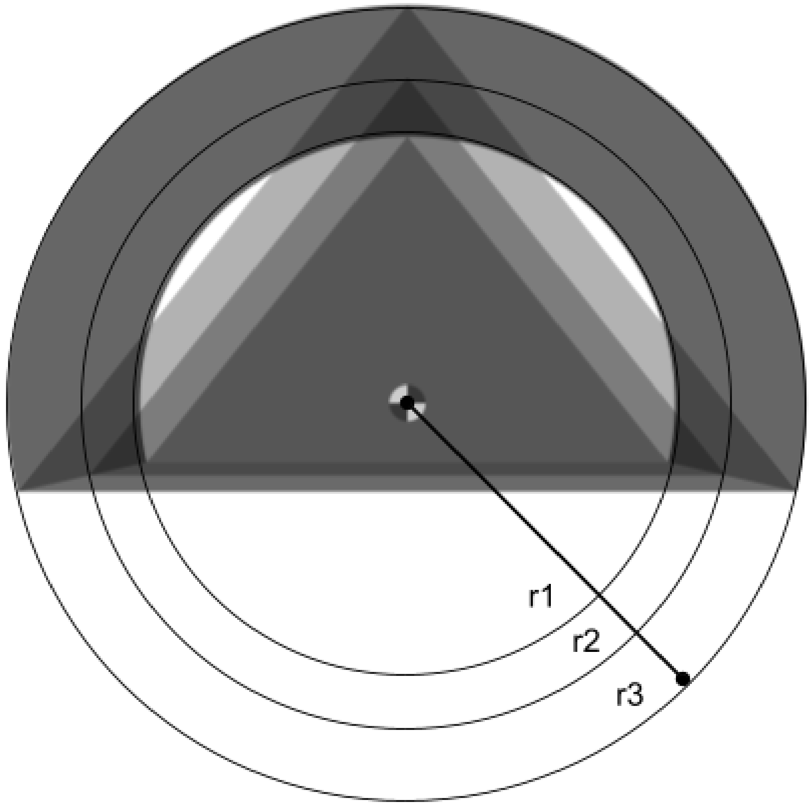
$D = 2 \cdot (120/7) \cdot (sin(\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \div (1 + sin(\pi/14))$

$a = 0.1027046095\, m$ | $D = 0.2054092190\, m$

$a = 10.2704609520\, cm$ | $D = 20.5409219039\, cm$

$a = 4.0434885638\, in$ | $D = 8.0869771275\, in$

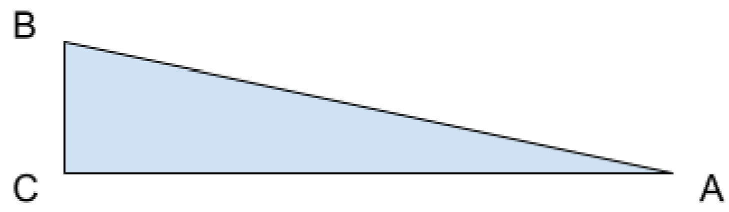
The 3 Radiuses:



Radiuses: 1, 2, 3 or: a, b, c

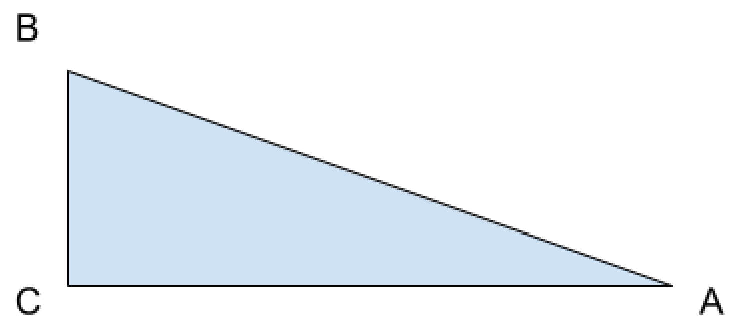
$a = 0.1027046095\ m$	$a = 10.2704609520\ cm$	$a = 4.0434885638\ in$
$b = 0.1255585352\ m$	$b = 12.5558535152\ cm$	$b = 4.9432494154\ in$
$c = 0.1534979377\ m$	$c = 15.3497937660\ cm$	$c = 6.0432258921\ in$

Angles at the endpoint:



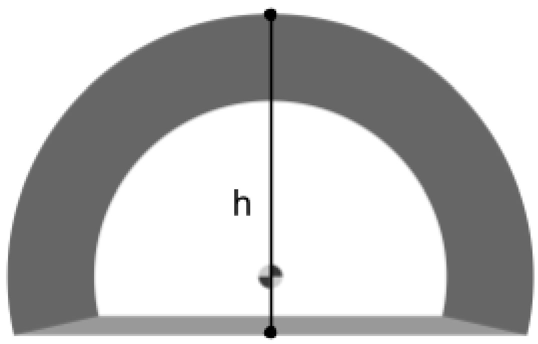
$A = \pi/14$ $B = 3\pi/7$ $C = \pi/2$

Angles at the brim: the dark circular area of the figure above

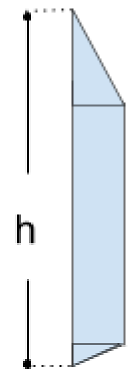


$A = \pi/7$ $B = 5\pi/14$ $C = \pi/2$

Outer Height of the Boss:



Profile view:



$h = Outer\ height = (Outer\ radius) \cdot (1 + sin(\pi/14))$

$h = c \cdot (1 + sin(\pi/14))$

$c = (120/7) \cdot (sin(\pi/14) + sin^{2}\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$h = (120/7) \cdot (sin(\pi/14) + sin^{2}\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot (1 + sin(\pi/14))$

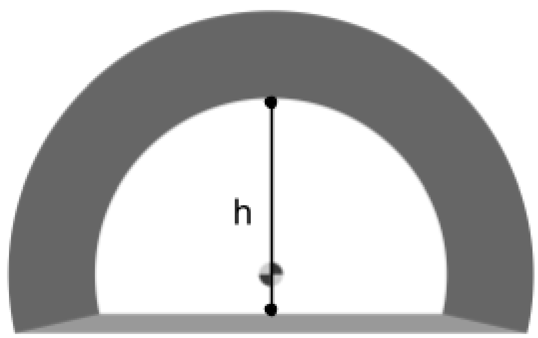
$h = (120/7) \cdot (1 + sin(\pi/14))^{2} \cdot (sin(\pi/14) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$h = 0.1876544421\ m$

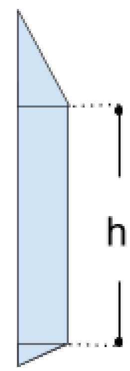
$h = 18.7654442108\ cm$

$h = 7.3879701617\ in$

Inner Height of the Boss is the same as radius 2



Profile view:



Radius 2:

$b = c \div (1 + sin(\pi/14))$

$b = (120/7) \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \div (1 + sin(\pi/14))$

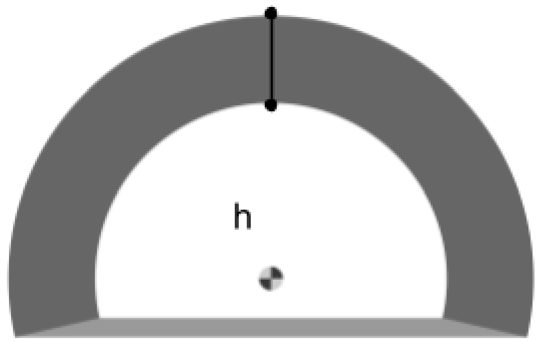
$b = (120/7) \cdot (sin(\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$b = 0.1255585352\, m$

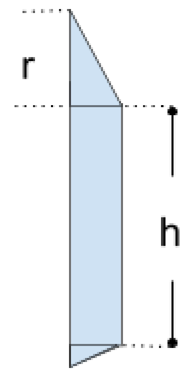
$b = 12.5558535152\, cm$

$b = 4.9432494154\, in$

Length of the Boss' brim:



Profile view:



$$Brim = radius\,3 - radius\,1$$

$$Br = c - a$$

$$c = (120/7) \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$$a = (120/7) \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \div (1 + sin(\pi/14))^2$$

$$Br = (120/7) \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot \frac{sin^2\pi/14 + 2 \cdot sin(\pi/14}{(1+sin(\pi/14))^2}$$

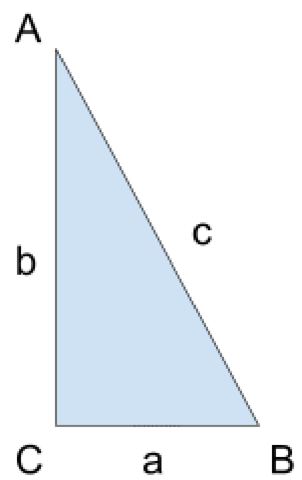
$$Br = \frac{120 \cdot (sin^2\pi/14 + 2 \cdot sin(\pi/14)}{7 \cdot (1+sin(\pi/14))^2} \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

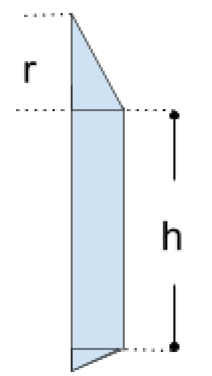
$$Br \approx 0.0507933281\,m$$

$$Br \approx 5.0793328140\,cm$$

$$Br \approx 1.9997373283\,in$$

Horizontal Height of the Boss: the thickness





$Angle\ A\ =\ \pi/7$

$BossHeight\ =\ a$

$BossHeight\ =\ Ring\ Radius\ \cdot\ tan\ A\ =\ Br\ \cdot\ tan\ A$

$$Br\ =\ \frac{120\cdot(sin^2\pi/14 + 2\cdot sin(\pi/14)}{7\cdot(1+sin(\pi/14))^2}\cdot(sin(\pi/14)\ +\ sin^2\pi/14))\ \cdot\ (cos(5\pi/14)\ -\ sin(5\pi/14)\ +\ 1/2)$$

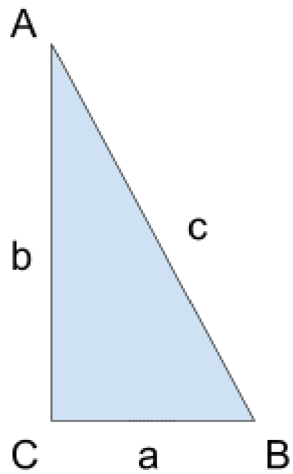
$BossHeight\ =\ Br\ \cdot\ tan\,\pi/7\ =\ a$

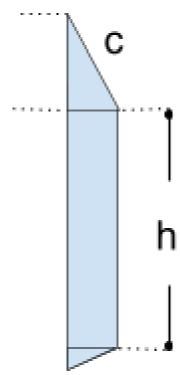
$a\ \approx\ 0.0244607776\ m$

$a\ \approx\ 2.4460777637\ cm$

$a\ \approx\ 0.9630227416\ in$

Hypotenuse of the Boss: at the dark circular area of the figure above





$c = \sqrt{a^2 + b^2}$

$a = Ring\ Radius = 2.6458822717\ cm$

$b = Height = 1.2741897464\ cm$

$Br = \frac{120 \cdot (sin^2 \pi/14 + 2 \cdot sin(\pi/14)}{7 \cdot (1 + sin(\pi/14))^2} \cdot (sin(\pi/14) + sin^2 \pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$BossHeight = Br \cdot tan\, \pi/7$

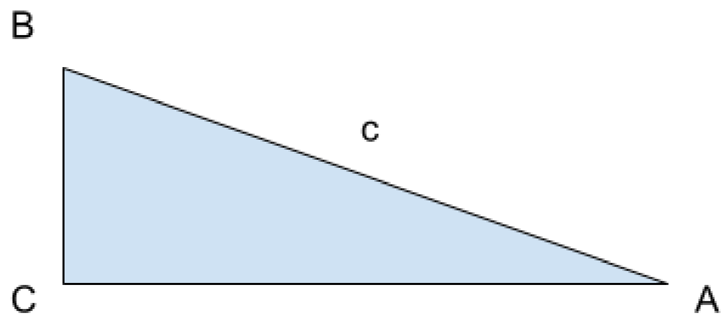
$c = \sqrt{(Br)^2 + (BossHeight)^{\ 2}}$

$c = 0.0563763410\ m$

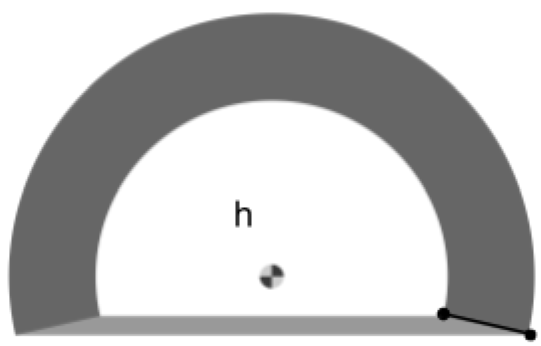
$c = 5.6376341014\ cm$

$c \approx 2.2195409848\ in$

Endhead angle measures of the Boss: Endhead c:



$A = \pi/7$ $\quad B = 5\pi/14$ $\quad C = \pi/2$



$c = \ hypotenuse = Brim\ radius$

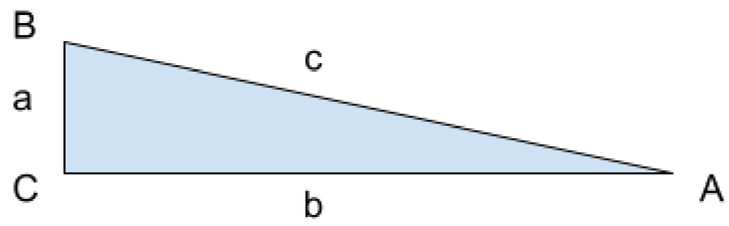
$$c = \frac{120 \cdot (sin^2\pi/14 + 2 \cdot sin(\pi/14)}{7 \cdot (1+sin(\pi/14))^2} \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$$

$c \approx 0.0507933281\ m$

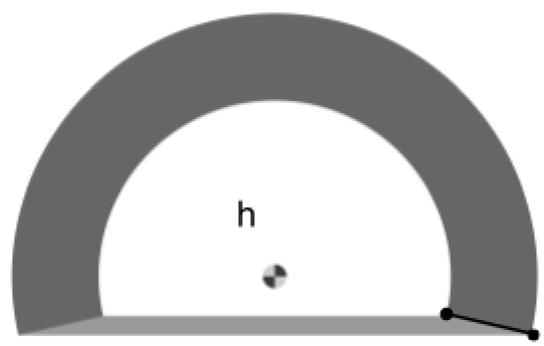
$c \approx 5.0793328140\ cm$

$c \approx 1.9997373283\ in$

Endhead a:



$A = \pi/14$ $B = 3\pi/7$ $C = \pi/2$



$a = c \cdot sin\,\pi/14$

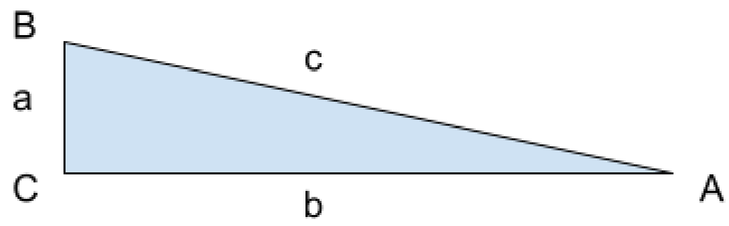
$c = \frac{120 \cdot (sin^2\pi/14 + 2 \cdot sin(\pi/14)}{7 \cdot (1+sin(\pi/14))^2} \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$a \approx 0.0113025788\,m$

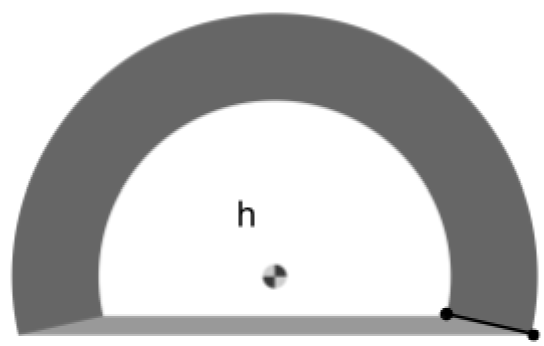
$a \approx 1.1302578816\,cm$

$a \approx 0.4449834180\,in$

Endhead b:



$A\ =\ \pi/14$ $B\ =\ 3\pi/7$ $C\ =\ \pi/2$



$b = c \cdot cos\,\pi/14$

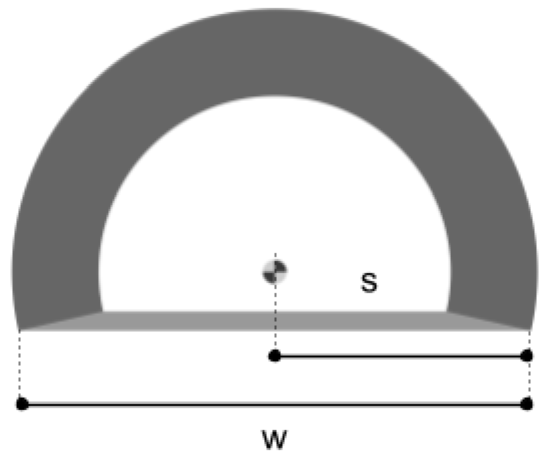
$c\ = \frac{120 \cdot (sin^2\pi/14 + 2 \cdot sin(\pi/14)}{7 \cdot (1+sin(\pi/14))^2} \cdot (sin(\pi/14)\ +\ sin^2\pi/14)) \cdot (cos(5\pi/14)\ -\ sin(5\pi/14)\ +\ 1/2)$

$b\ \approx\ 0.0495198334\ m$

$b\ \approx\ 4.9519833356\ cm$

$b\ \approx\ 1.9495997384\ in$

Outer Horizontal sidelength and width of the Boss:



Base Sidelength:

$s = c \cdot (cos\,\pi/14)$

Base width:

$w = 2 \cdot c \cdot (cos\,\pi/14)$

$Outer\,radius = radius\,3 = c$

$c = (120/7) \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

$s = (120/7) \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot (cos\,\pi/14)$

$w = (240/7) \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \cdot (cos\,\pi/14)$

$s = 0.1496494239\,m$

$s = 14.9649423887\,cm$

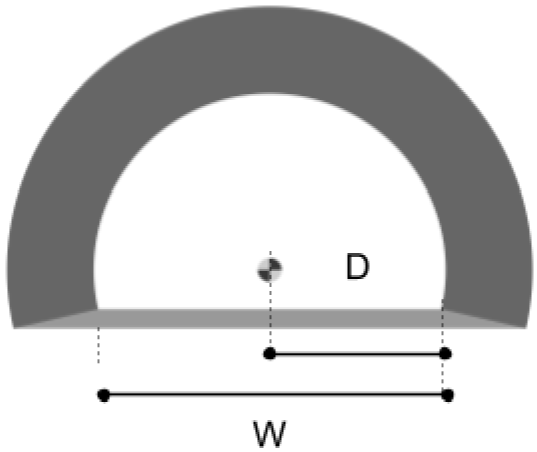
$s = 5.8917096018\,in$

$w = 0.2992988478\,m$

$w = 29.9298847774\,cm$

$w = 11.7834192037\,in$

Inner Horizontal sidelength of the Boss:



Base Sidelength:

$s = c \cdot (cos\, \pi/14)$

$inner\, radius = radius1 = c$

$c = (120/7) \cdot (sin(\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2) \div (1 + sin(\pi/14))$

Base width:

$w = 2 \cdot c \cdot (cos\, \pi/14)$

$s = 0.1001295905\, m$

$s = 10.0129590530\, cm$

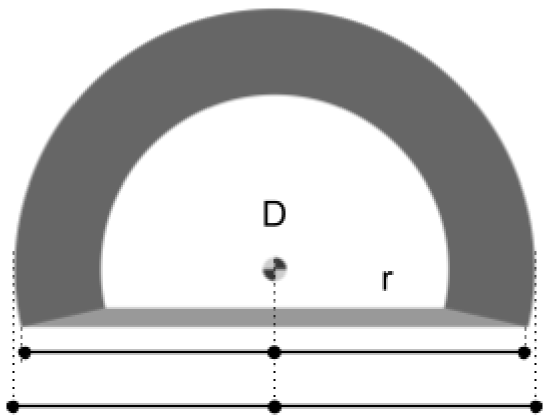
$s = 3.9421098634\, in$

$w = 0.2002591811\, m$

$w = 20.0259181061\, cm$

$w = 7.8842197268\, in$

Difference of Outer radius and Outer sidelength and Outer Diameter and Outer base width



Difference 1:

$difference = c - c \cdot (\cos \pi/14)$

$Outer\ radius = radius\ 3 = c$

$c = (120/7) \cdot (\sin(\pi/14) + \sin^2 \pi/14)) \cdot (\cos(5\pi/14) - \sin(5\pi/14) + 1/2)$

$d = 0.0038485138\ m$

$d = 0.3848513773\ cm$

$d = 0.1515162903\ in$

Difference 2:

$difference = 2(c - c \cdot (\cos \pi/14))$

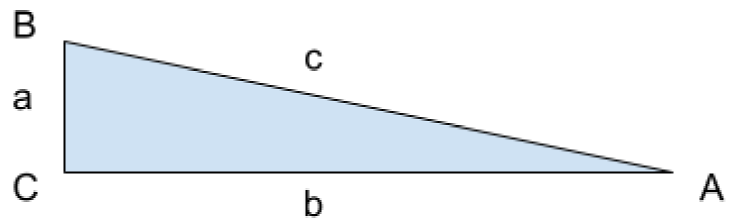
$d = 0.0076970275\ m$

$d = 0.7697027546\ cm$

$d = 0.3030325805\ in$

Base measures of the Boss:

Base a: Endhead a:



$A = \pi/14$ $B = 3\pi/7$ $C = \pi/2$

To calculate side a, the shortest side of the Boss's base, we use the measurements from the Endhead's side a.

$a = c \cdot sin\,\pi/14$

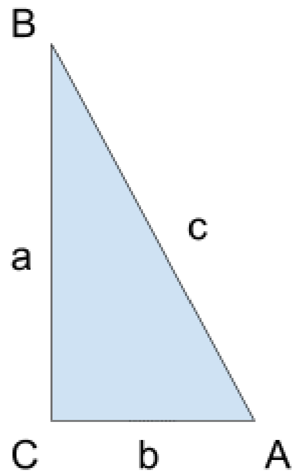
$c = \frac{120 \cdot (sin^2\pi/14 + 2 \cdot sin(\pi/14)}{7 \cdot (1+sin(\pi/14))^2} \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

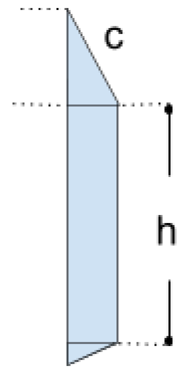
$a \approx 0.0113025788\, m$

$a \approx 1.1302578816\, cm$

$a \approx 0.4449834180\, in$

Base b: Horizontal Height of the Boss: the thickness





$A = 5\pi/14$ $B = \pi/7$ $C = \pi/2$

$BossHeight = b$

$BossHeight = Ring\ Radius \cdot tan\ A = Br \cdot tan\ A$

$Br = \frac{120 \cdot (sin^2\pi/14 + 2 \cdot sin(\pi/14)}{7 \cdot (1+sin(\pi/14))^2} \cdot (sin(\pi/14) + sin^2\pi/14)) \cdot (cos(5\pi/14) - sin(5\pi/14) + 1/2)$

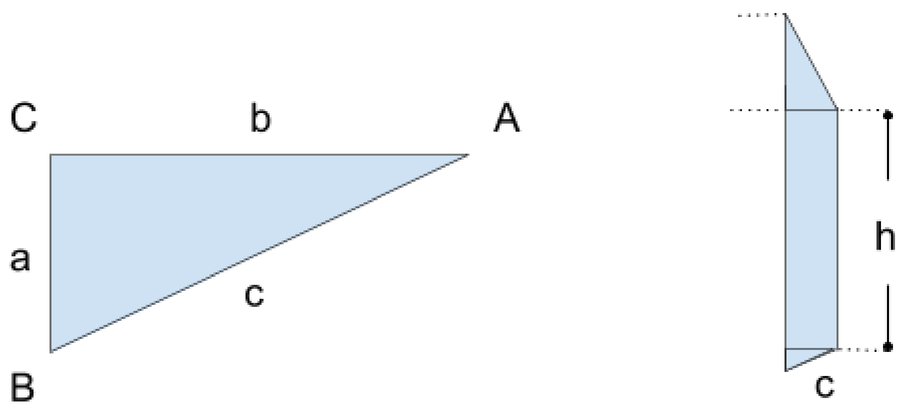
$BossHeight = Br \cdot tan\ \pi/7 = b$

$b \approx 0.0244607776\ m$

$b \approx 2.4460777637\ cm$

$b \approx 0.9630227416\ in$

Base c:



$c = \sqrt{a^2 + b^2}$

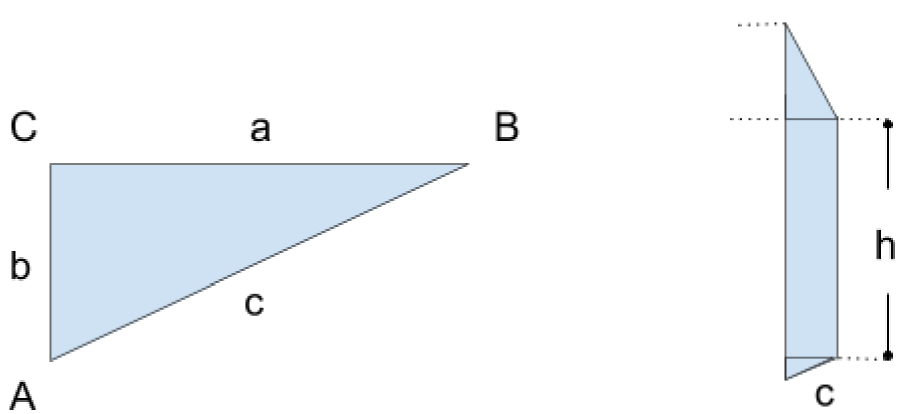
$c = \sqrt{(1.1302578816)^2 + (2.4460777637)^2}$

$c = 0.0269458333\ m$

$c = 2.6945833268\ cm$

$c = 1.0608595775\ in$

Angle A:



$A = tan^{-1}(a/b)$

$A = tan^{-1}(2.4460777637 \,/\, 1.1302578816)$

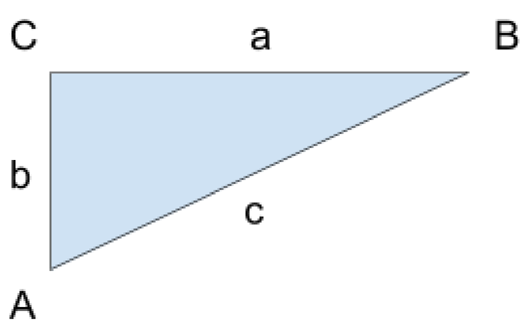
$A = 1.1379508728\, radians$ $\qquad$ $A = 65.1997823044\, degrees$

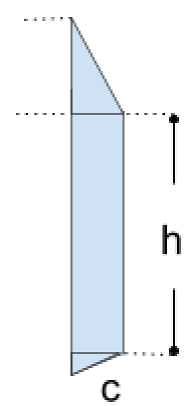
Angle B:

$B = tan^{-1}(1.1302578816 \,/\, 2.4460777637)$

$B = 0.4328454540\, radians$ $\qquad$ $B = 24.8002176956\, degrees$

Also: Angle A:





$A = tan^{-1}(a/b)$

$$tan\, \theta = \frac{5.35 \cdot tan\, \pi/7 \cdot (sin^2 \pi/14 - 2 \cdot sin\, \pi/14)}{5.35 \cdot sin\, \pi/14 \cdot (sin^2 \pi/14 - 2 \cdot sin\, \pi/14)}$$

$$tan\, \theta = \frac{tan\, \pi/7}{sin\, \pi/14}$$

$$A = tan^{-1}\left(\frac{tan\, \pi/7}{sin\, \pi/14}\right)$$

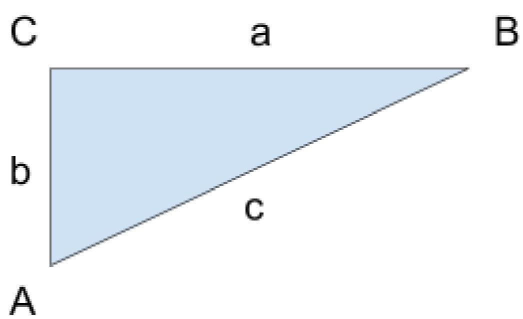
$A = 1.1379508728\, radians$ $\qquad$ $A = 65.1997823044\, degrees$

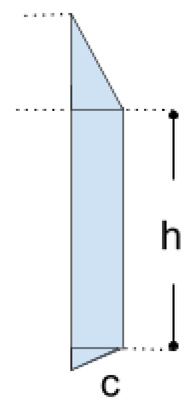
Angle B:

$$B = tan^{-1}\left(\frac{sin\,\pi/14}{tan\,\pi/7}\right)$$

$B = 0.4328454540\, radians$ $B = 24.8002176956\, degrees$

Angles at the base:





$A = tan^{-1}\left(\frac{tan\,\pi/7}{sin\,\pi/14}\right)$ $B = tan^{-1}\left(\frac{sin\,\pi/14}{tan\,\pi/7}\right)$ $C = \pi/2$

50. Linked by Geometry: The Stonehenge-Pyramid Connection

Stonehenge and the Great Pyramid of Giza are two of the most remarkable monuments in human history, standing tall in their respective landscapes for thousands of years. These structures have puzzled archaeologists and historians, who have long wondered about their purpose and the methods used to build them. While separated by vast distances and cultural differences, recent discoveries suggest there may be a hidden connection between them, grounded in a shared understanding of geometry. By examining the mathematics and design of these two monuments, we uncover intriguing similarities that point to a possible shared source of knowledge.

The Geometry of Stonehenge and the Great Pyramid

Both Stonehenge and the Great Pyramid showcase sophisticated use of geometry. The Great Pyramid's design is centered on the use of both the **heptagon (7 sides)** and the **dodecagon (14 sides)**, geometric shapes that are reflected in the overall proportions and layout of the pyramid. These shapes are not just random; they are carefully chosen to represent harmony, balance, and an understanding of mathematical ratios that were central to the pyramid's design.

Similarly, Stonehenge is marked by the **56 Aubrey holes**, which form a circle around the monument. These holes were traditionally thought to be aligned with astronomical or ceremonial purposes, but they also hold a mathematical significance. The number **56** is a multiple of both **7** and **14**, the same numbers tied to the geometry of the Great Pyramid.

The Mathematics of the Connection

The key connection between Stonehenge and the Great Pyramid lies in the number **56**. Mathematically, 56 is a multiple of both **7** and **14**, and these numbers play a central role in the geometry of both monuments. For instance:

- **56 ÷ 7 = 8**
- **56 ÷ 14 = 4**

These relationships reveal a connection between the design principles used in Stonehenge and the Great Pyramid. While the specific meaning of these numbers is still a subject of debate, their repeated use in these monuments suggests that both the builders of Stonehenge and the Great Pyramid shared a similar understanding of geometry and proportion.

The Great Ratio in Both Monuments

Another fascinating aspect of the connection between these two monuments is the presence of the **Great Ratio**. This mathematical constant, approximately equal to **1.22253**, appears to have been consciously incorporated into the design of both Stonehenge and the Great Pyramid.

At Stonehenge, the distance between the **56 Aubrey holes** follows the expansion of the **heptagon (7 sides)** and **dodecagon (14 sides)**, with the multiples of these numbers playing a key role in the spacing. This suggests a deliberate use of geometric principles tied to these figures. Further investigation is needed to determine whether the **inner circles** at Stonehenge correspond to the **7 inner circles** of these geometric shapes, aligning with the same proportions used in the overall design. Similarly, the Great Pyramid, with its precise geometric design, also reflects the Golden Ratio in its proportions, showcasing a shared mathematical framework between the two structures.

The presence of the Great Ratio in both structures suggests that the builders of these monuments were not just skilled engineers but also had a deep understanding of geometry and natural proportions. The fact that both monuments share this characteristic hints at a possible shared cultural or intellectual heritage, where geometry was seen as a fundamental principle of construction and cosmic harmony.

Implications for Our Understanding of Ancient Knowledge

The similarities between Stonehenge and the Great Pyramid invite us to reconsider our understanding of ancient civilizations. The presence of common geometric principles in these monuments suggests that the builders may have been connected by a shared knowledge system, one based on sacred geometry and universal proportions. This does not necessarily mean that the same group of people built both monuments, but it does suggest that the builders of both sites may have been influenced by similar ideas or traditions that transcended cultural boundaries.

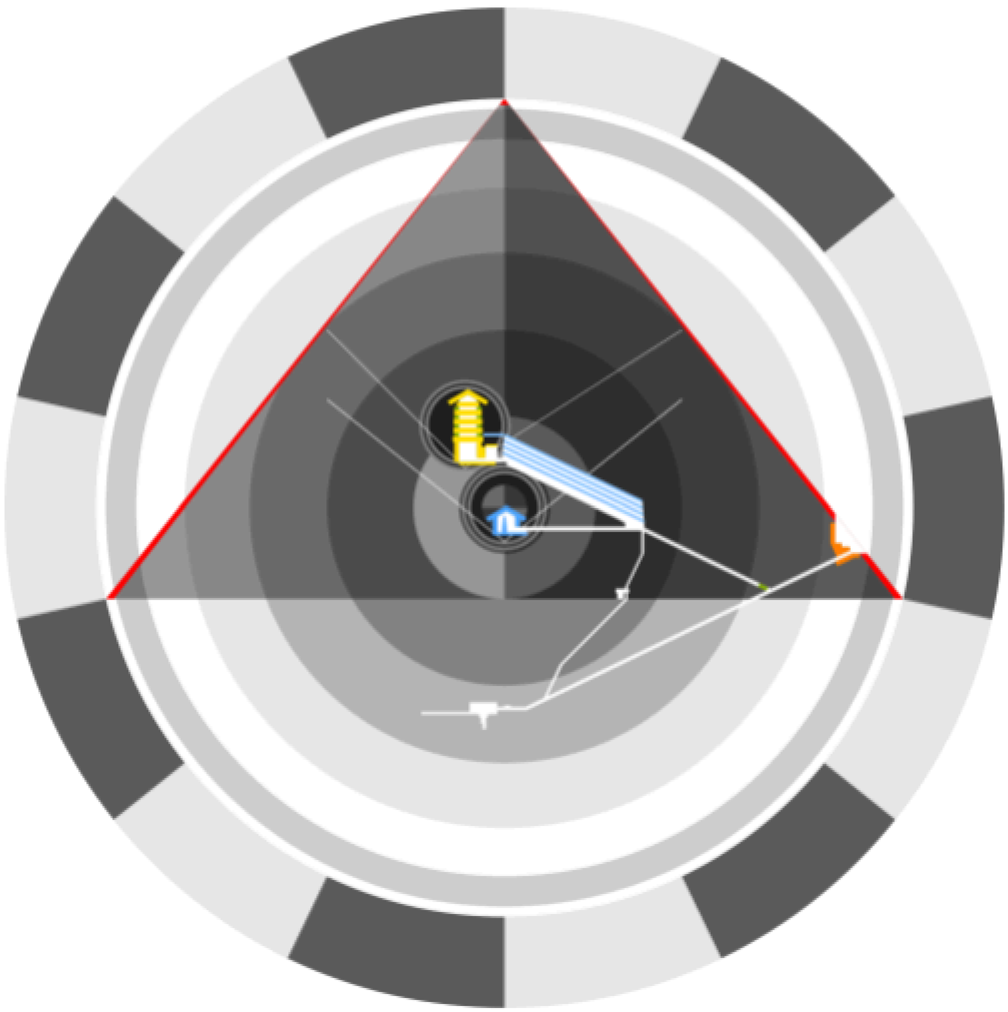
This discovery also challenges the notion that ancient cultures were isolated from one another. The use of the same mathematical principles in different parts of the world points to the possibility of knowledge exchange or a common intellectual tradition that existed long before the rise of written history.

Conclusion

The connection between Stonehenge and the Great Pyramid is a reminder that ancient monuments were not just feats of engineering, but also expressions of deeper knowledge. By examining the geometry and design of these structures, we see that both were constructed using similar principles of mathematics and proportion. The number **56**, the use of **7** and **14**, and the presence of the **Great Ratio** in both sites all point to a shared understanding of geometry that spanned ancient civilizations. While we may never fully understand the extent of this shared knowledge, the connection between Stonehenge and the Great Pyramid offers a fascinating glimpse into the sophisticated thought processes of the ancient builders.

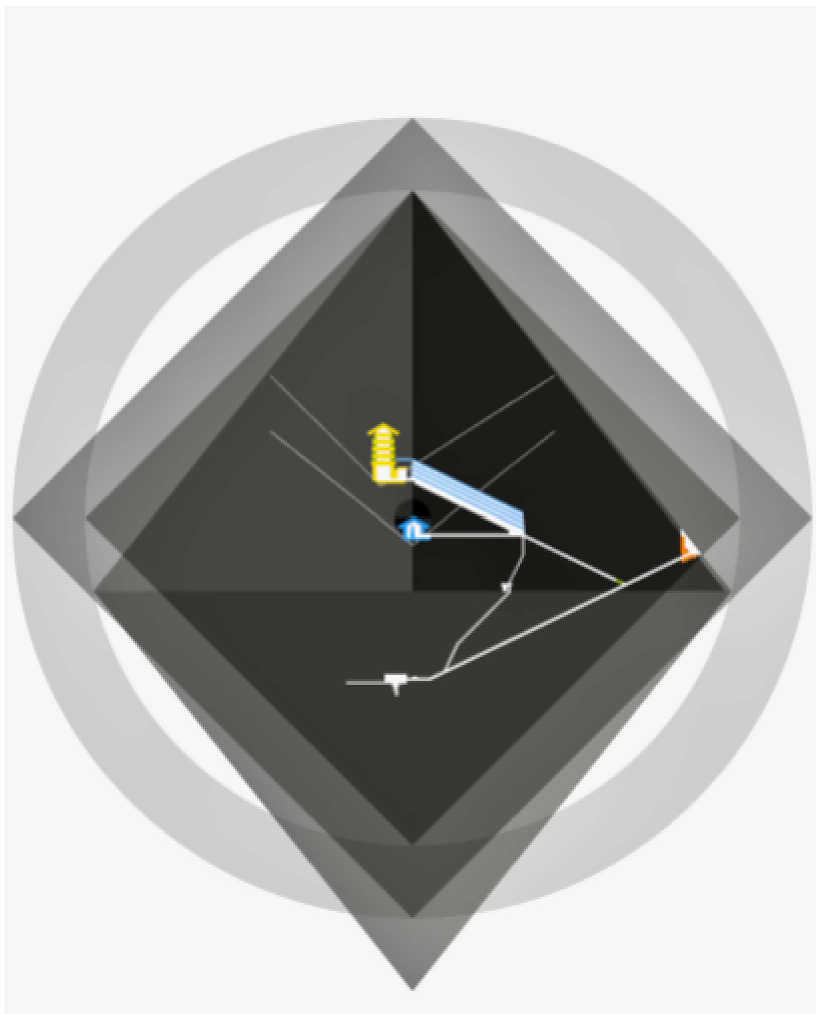
51. Hidden Images of the Great Pyramid

Here, we present an image that accurately illustrates the true scale of the various sections of the monument.



Hidden Image of the Pyramid's Design

Here, we present an image that reveals hidden aspects of the pyramid's design, which can only be uncovered through the use of mathematics and computer graphics.



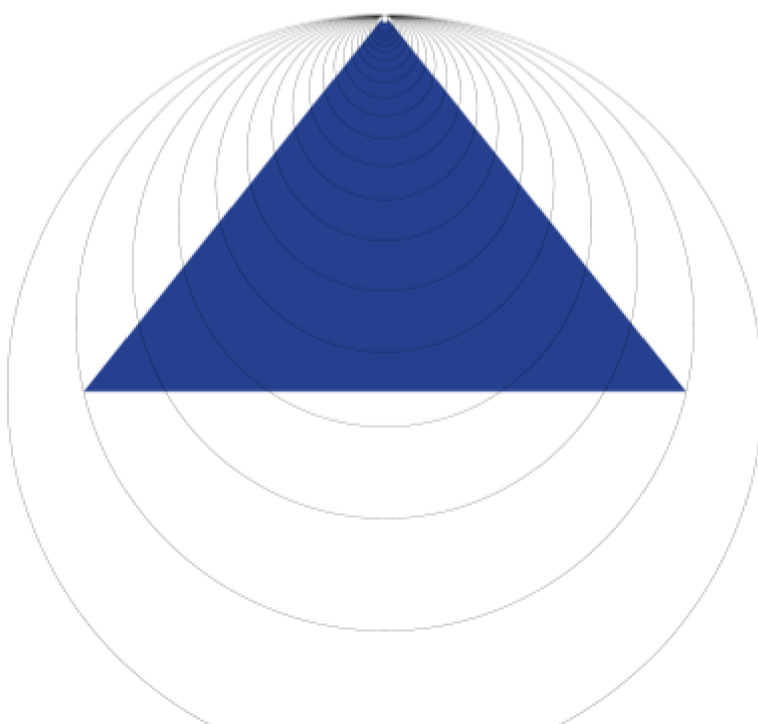
The Boss of the King's Chamber

Here, we present an image that uncovers hidden aspects of the Boss of the King's Chamber, revealed through the application of mathematics and computer graphics. All three images were generated using Swift, Apple's programming language, through an app specifically designed based on the *Great Ratio* mathematical study.

The Hidden Frequency

In this section, we introduce visual evidence of a mysterious and previously unrecognized frequency embedded within the design of the Great Pyramid—a frequency directly linked to the Great Ratio. This frequency is not acoustic, but **geometric in nature**, emerging through repeated spatial intervals, wave-like progressions, and harmonic alignments that govern the proportions of the structure.

The discovery of this geometric frequency is one of the more enigmatic outcomes of the *Great Ratio* study. It suggests that the pyramid is not only a monument of extraordinary mathematical and architectural precision, but also a vessel for encoded patterns that reflect **wave-based design principles**—a kind of spatial resonance built into stone.



Generation Method and Tools

The visual representation of this geometric frequency was made possible through the use of a proprietary application developed by the author using Apple's **Swift** programming language. This unpublished tool was specifically designed to explore the spatial harmonics embedded in the architecture of the Great Pyramid. By converting mathematical data derived from the *Great Ratio* into visual waveforms and geometric patterns, the app played a pivotal role in revealing the hidden frequency underlying the monument's design.

The Role of the Great Ratio

The frequency is mathematically tied to the Great Ratio, acting as a **carrier** or **generator** of the spatial waveforms present in the architecture. Just as sound is defined by vibrations in time, this frequency appears as a rhythmic modulation of space itself—only made visible through the proper geometric lens.

Interpretations and Implications

The presence of such a frequency raises profound questions: Was this design intentional? Was it meant to create energetic or perceptual effects for those within or near the pyramid? Could this be part of the so-called "resonance chamber" theory, or is it an entirely new category of spatial information encoding?

Though the exact function remains speculative, the consistent mathematical presence of this frequency affirms that the builders possessed an advanced and possibly **multisensory understanding of geometry**, one that transcends conventional architectural design.

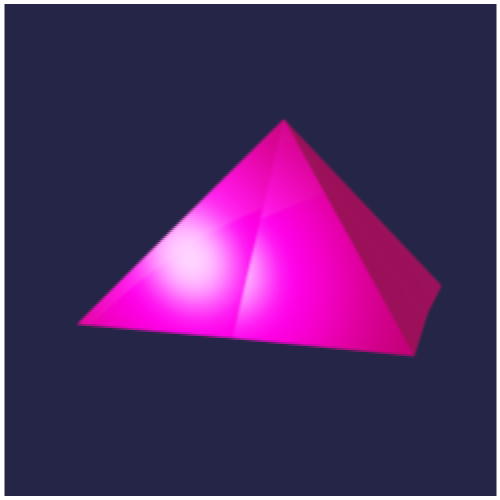
Visual Study of the Capstone

This section presents a series of visual renderings that uncover hidden aspects of the Capstone of the Great Pyramid, revealed through the application of advanced mathematics and computer graphics. All three images were created using **Blender**, a 3D rendering program, and are based directly on the findings of the **Great Ratio** mathematical study.

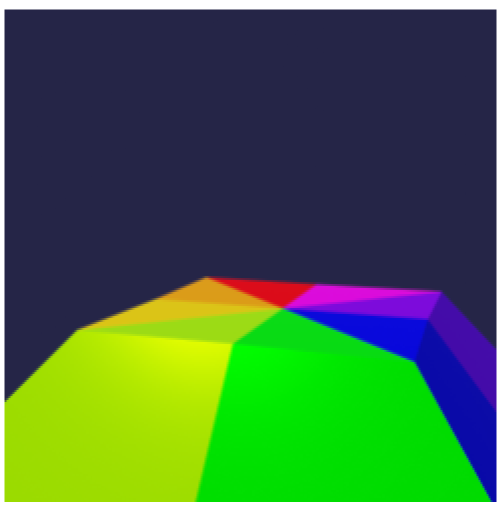
The Capstone, as revealed in this research, is an **eight-sided miniature pyramid**, faithfully following the same geometric logic and design principles as the larger pyramid it crowns. This design detail is a critical extension of the pyramid's overall structure and symmetry, and it reinforces the hypothesis that the Capstone was not merely symbolic, but a precise mathematical component of the complete monument.

1. **Capstone in Position**
   The first image shows the Capstone placed atop the Great Pyramid, offering a complete reconstruction of how the monument would appear with its summit restored.

2. **Capstone Alone**
   The second image isolates the Capstone, allowing for a focused study of its eight-sided geometry and alignment within the overarching mathematical framework.



3. **Pyramid Without Capstone**
   The third image displays the top portion of the Great Pyramid with the Capstone removed, revealing the structure's current state and highlighting the precision with which the Capstone would have completed the original form.



These visualizations serve not only as illustrations but as extensions of the mathematical research, offering concrete representations of otherwise abstract geometric relationships. They also invite a reconsideration of the symbolic and structural significance of the Capstone within the full design of the Great Pyramid.

52. Conclusions and Implications

The scientific and mathematical findings presented in ***The Great Ratio*** provide conclusive evidence supporting extraordinary claims about the Great Pyramid and its builders, pointing toward lost ancient technologies and advanced knowledge. These revelations go beyond traditional interpretations, introducing a radically new perspective on the capabilities of ancient civilizations. The key claims include:

1. **Use of the Meter as a Unit of Measure:** Contrary to mainstream archaeological consensus, evidence suggests that the builders of the Great Pyramid used the meter—a fundamental unit of length in modern measurement systems—long before its recognized invention. This implies a highly advanced understanding of standardized units and precision engineering in ancient times.

2. **Design Executed on Computers:** The precision and complexity of the pyramid's design indicate that it may have been conceived with tools comparable to modern computers. The geometric exactness, coupled with intricate alignments, suggests that the builders had access to advanced technological resources that could simulate the complex calculations and designs we now achieve with computational tools.

3. **Use of 3D CAD Software:** The advanced geometry of the Great Pyramid implies that its design process may have involved the use of 3D computer-aided design (CAD) software, akin to programs like AutoCAD or Blender. This raises the possibility that the builders used tools or methods resembling modern digital design, enabling them to execute their intricate and precise plans.

4. **Understanding of Irrational Numbers:** The dimensions and alignments of the pyramid reveal a practical knowledge of irrational numbers, such as the square root of 2 and the golden ratio (ϕ), typically associated with much later periods in mathematical history. The builders appear to have used these concepts with great sophistication, integrating them seamlessly into the monument's proportions.

5. **Early Concept of Zero:** Long before the formal mathematical concept of zero was established, the builders of the Great Pyramid may have understood and utilized it in their designs. This understanding would have been critical for the precision and accuracy seen in their engineering feats.

6. **Knowledge of the Golden Ratio (ϕ) and Pi (π):** The presence of the golden ratio and pi in the pyramid's structure strongly suggests that the builders had an advanced understanding of these mathematical constants. These ratios are embedded within the monument's height, base, and angles, demonstrating a grasp of harmonic proportions that reveals a sophisticated level of mathematical awareness.

7. **Mastery of Trigonometry and Inverse Angle Functions:** The builders demonstrated a working knowledge of trigonometric principles, including inverse angle operations such as arc sine ($\sin^{-1}$), arc tangent ($\tan^{-1}$), and arc cotangent ($\cot^{-1}$). This mastery is remarkable, given that modern trigonometry wasn't developed until much later, suggesting a deep understanding of geometric relationships and their practical application in construction.

8. **The Pyramid as a Multidimensional Object:** The Great Pyramid appears to transcend its three-dimensional physical form, presenting itself as a multidimensional object that can only be fully understood through modern

mathematical tools. The intricate relationships between its dimensions and angles suggest a design that incorporates higher-dimensional geometry, pointing to a level of complexity beyond what we currently achieve with conventional architectural methods. This implies that the software employed for the design of the pyramid may have been more advanced than even the most sophisticated modern counterparts, indicating a level of computational capability far ahead of its time.

9. **The Great Ratio as the Key to Reverse Engineering**: The *Great Ratio* is a secret irrational number that holds the key to reverse engineering not only the Great Pyramid but the entire pyramidal complex. This number allows for the precise reconstruction of the pyramid's design, as well as the exact placement of all its components on the ground. It unlocks the geometric and spatial blueprint of the complex, revealing a deep and systematic order that was deliberately encoded into the layout of the structures.

10. **Extension to Other Monuments:** The principles of the Great Ratio extend beyond Giza, applying to the Red Pyramid, the Bent Pyramid, and even Stonehenge in England. While the mathematical details of the Red and Bent Pyramids are not included here to limit the paper's length, they will be presented in future work. A dedicated section on calculus concepts and advanced mathematical extensions has also been reserved for forthcoming publications.

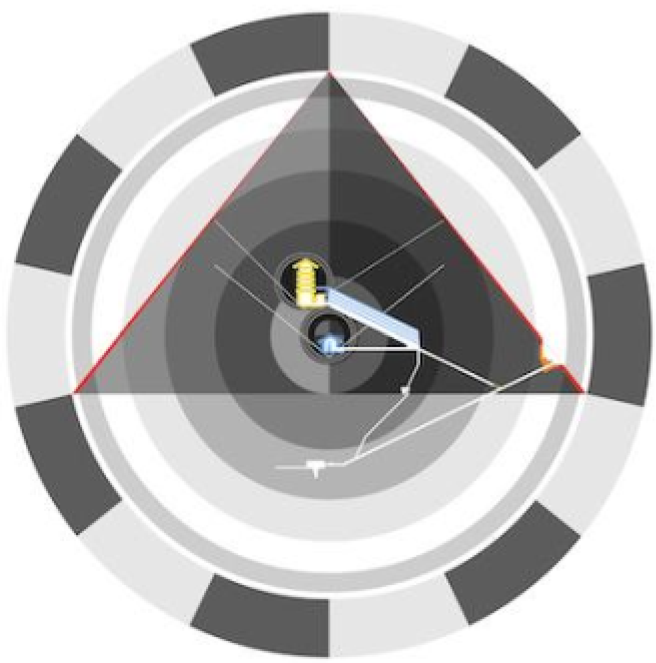
These revelations about the Great Pyramid suggest that it is more than just a monumental structure; it is a manifestation of lost knowledge, embedded with mathematical, geometric, and technological concepts that challenge our understanding of ancient civilizations. These findings compel us to reconsider the timeline of human progress and the technological capabilities of the distant past.

Appendix

Summary of Formulas and Measures

This section presents the key measurements developed in detail throughout this white paper. The information is displayed here without the accompanying mathematical calculations, providing easy access to the final dimensions of the pyramid in a straightforward and concise format. For detailed calculations and the derivation of these numbers, please refer to the relevant sections within the white paper for a more comprehensive explanation or proof.

Pyramid 1



The Tetradecagon

Angles Measures			
Radian	**Degree**	**Sine**	**Cosine**
$A = \pi/2$	90	1	0
$B = 5\pi/14$	64.2857142857	0.9009688679	0.4338837391
$C = 3\pi/14$	38.5714285714	0.6234898019	0.7818314825
$D = \pi/14$	12.8571428571	0.2225209340	0.9749279122
$E = 27\pi/14$	347.1428571429	-0.2225209340	0.9749279122
$F = 25\pi/14$	321.4285714286	-0.6234898019	0.7818314825
$G = 23\pi/14$	295.7142857143	-0.90096886794	0.4338837391
$H = 3\pi/2$	270	-1	0
$I = 19\pi/14$	244.2857142857	-0.9009688679	-0.4338837391
$J = 17\pi/14$	218.5714285714	-0.6234898019	-0.7818314825
$K = 15\pi/14$	192.8571428571	-0.2225209340	-0.9749279122
$L = 13\pi/14$	167.1428571429	0.2225209340	-0.9749279122
$M = 11\pi/14$	141.4285714286	0.6234898019	-0.7818314825
$N = 9\pi/14$	115.7142857143	0.90096886794	-0.4338837391

Tetradecagon Circle Iterations

Pyramid – Tetradecagon circle iterations		
Circle Pre iteration	**Radius (Meter)**	**Diameter (Meter)**
1	98. 1578283585	196. 3156567171
2	95. 6968066659	191. 3936133318
3	88. 4371474919	176. 8742949839
4	76. 7428804614	153. 4857609228
5	61. 2004049541	122. 4008099083
6	42. 5890855919	85. 1781711837
7	21. 8421716415	43. 6843432829
Circle Iteration 1	**Radius**	**Diameter**
1	120	240
2	116.9913494618	233.9826989236
3	108.1162641483	216.2325282966
4	93.8197778962	187.6395557923
5	74.8187762230	149.6375524461
6	52.0660486941	104.1320973882
7	26.7025120748	53.4050241495

Tetradecagon circle iterations:

Circle Iteration 2	Radius	Diameter
1	146. 7025120748	293. 4050241495
2	143. 0243738089	286. 0487476177
3	132. 1743962224	264. 3487924449
4	114. 6966424972	229. 3932849944
5	91. 4675201857	182. 9350403713
6	63. 6518344769	127. 3036689539
7	32. 6443800006	65. 2887600012
Circle Iteration 3	**Radius**	**Diameter**
1	179. 3468920754	358. 6937841507
2	174. 8502910473	349. 7005820947
3	161. 5859663150	323. 1719326299
4	140. 2190465073	280. 4380930146
5	111. 8209582041	223. 6419164081
6	77. 8157001328	155. 6314002656
7	39. 9084379268	79. 8168758535

Tetradecagon circle iterations:

Circle Iteration 4	Radius	Diameter
1	219. 2553300021	438. 5106600043
2	213. 7581411137	427. 51628222758
3	197. 5422264536	395. 0844529072
4	171. 4207196946	342. 8414393892
5	136. 7034622595	273. 4069245190
6	95. 1313224028	190. 2626448056
7	48. 7889008070	97. 5778016140

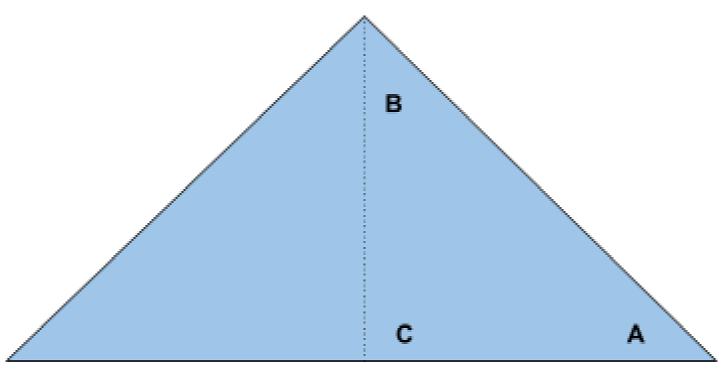
Dimensions of Pyramid One: GRP1

Outside angles of Pyramid One

Basic outside measures		
Measure	**Meter**	**Feet**
Height	146. 7025120748	481. 3074543135
Height minus capstone	144. 8634429418	475. 2737629325
Capstone height	1. 8390691329	6. 0336913810
Outer sidelength	116. 9913494618	383. 8298866858
Outer width	233. 9826989236	767. 6597733715
Inner sidelength	114. 6966424972	376. 3013205288
Inner sidelength	229. 3932849944	752. 6026410577
Partition depth	2. 2947069646	7. 5285661569
Outer slant height	187. 6395557923	615. 6153405260
Inner slant height	186. 2174719224	610. 9497110315
Slant height difference	1. 4220838699	4. 6656294945
Partition measures		
Side A	2. 2947069646	7. 52856615682415
Side B	116. 9913494618	383. 8298866858
Side C	117. 0138518678	383. 9037134770341
Perimeter of the base		
Inner Perimeter	936. 1108149424	3, 071. 229707816273
Outer Perimeter	935. 9307956946	3, 070. 6390934861
Difference	0. 1800192482	0. 5906143315

Outside angles for the 8-sided pyramid 1

Outer side angle A			
Angle	**Radian**	**Radian**	**Degree**
A	$2\pi/7$	0.8975979010	51.4285714286
B	$3\pi/14$	0.6731984258	38.5714285714
C	$\pi/2$	1.5707963268	90
Inner side angle A: at the mid-side partition			
A	$cot^{-1}\left(cos\left(\frac{3\pi}{14}\right)\right)$	0.9072323456	51.980584438
B	$tan^{-1}\left(cos\left(\frac{3\pi}{14}\right)\right)$	0.6635639812	38.0194155620
C	$\pi/2$	1.5707963268	90
Inner and outer angle differences			
A	0.0096344445	0.0096344445	0.5520130094
B	0.0096344445	0.0096344445	0.5520130094
Diagonal side angle A			
A	$tan^{-1}\left(\frac{1+sin(\pi/14)}{\sqrt{2}\cdot cos(\pi/14)}\right)$	0.7254092153	41.5628864579
B	$tan^{-1}\left(\frac{\sqrt{2}\cdot cos(\pi/14)}{1+sin(\pi/14)}\right)$	0.8453871115	48.4371135421
C	$\pi/2$	1.5707963268	90



Outside angles of Pyramid One

Diagonal measures		
Side A	146. 7025120748	481. 3074543135
Side B	165. 4507530892	542. 8174313951
Side C	221. 1234468500	725. 4706261484
Diagonal Width	330. 9015061785	1, 085. 6348627903

Internal measures		
Pyramid Circle One	**Meter**	**Feet**
Radius	120	393. 7007874016
Diameter	240	787. 4015748031
Circumference	753. 9822368616	
Pyramid Circle One	**Squared Meters**	**Squared Feet**
Area	45, 238. 9342116930	
Pyramid Circle One	**Cubic Meters**	**Cubic Feet**
Sphere Volume	7, 238, 229. 4738708	
Capstone	**Meter**	**Feet**
Height	1. 8390691329	6. 0336913810
Radius	**Meter**	**Feet**
Elevation from ground	26. 7025120748	87. 606669119
Pyramid One	**Cubic Meters**	**Cubic Feet**
Volume	2, 624, 706. 47538255	8, 611, 241. 71713435

Descending and Ascending Passageways:

Dimensions	Meters	Feet
Width	1. 0744855636	3. 5252151037
Perpendicular Height	1. 0744855636	3. 5252151037
Vertical height	1. 1925890027	3. 9126935783
Hidden side	0. 5174449757	1. 6976541198

Angles of Ascending Passageway:

Diagonal	Radian	Radian	Degree
Angle A	π/7	0. 4487989505	25. 7142857143
Angle B	5π/14	1. 1219973763	64. 2857142857
Angle C	π/2	1. 5707963268	90

Queen's Passageway:

Dimensions	Meters	Feet
Width	1. 0744855636	3. 5252151037
Height	1. 1925890027	3. 9126935783
Hidden side	0. 5174449757	1. 6976541198
Antichamber height	1. 7100339784	5. 6103476981

Distance to the Great Step:

Dimensions	Meters	Feet
Height (y)	37. 6309379726	123. 4610825872
Length (x)	78. 1414478731	256. 3695796363
Hypotenuse (h)	86. 7304639006	284. 5487660780

Grand Gallery:

Dimensions	Meters	Feet
Width	2. 1489711272	7. 0504302075
Height	8. 5958845089	28. 2017208299
East Ledge Width	0. 5372427818	1. 7626075519
West Ledge Width	0. 5372427818	1. 7626075519
Corridor Width	1. 0744855636	3. 5252151037
Corbel starting level	2. 2947069646	7. 5285661569
Corbel Width	0. 0767489688	0. 2518010788

Descending Passageway:

Dimensions	Meters	Feet
Height (y)	45. 9956360380	150. 9043177099
Length (x)	95. 5109223818	313. 3560445599
Hypotenuse (h)	106. 0091261579	347. 7989703344
Distance off front center	6. 6756280187	21. 9016667280

Angles of Descending Passageway:

Diagonal	Radian	Radian	Degree
Angle A	π/7	0. 4487989505	25. 7142857143
Angle B	5π/14	1. 1219973763	64. 2857142857
Angle C	π/2	1. 5707963268	90

Interaction point:

Descending and ascending passageways intersection point		
Dimensions	**Meters**	**Feet**
Height (y)	2. 4228301396	7. 9489177807
Length (x)	78. 1414478731	256. 3695796363

Angles of triangle to the Great Step:

Diagonal	Radian	Radian	Degree
Angle A	π/7	0. 4487989505	25. 7142857143
Angle B	5π/14	1. 1219973763	64. 2857142857
Angle C	π/2	1. 5707963268	90

Descending Passageway:

Dimensions	Meters	Feet
Height (y)	17. 6040539165	57. 7560824032
Length (x)	36. 5551946240	119. 9317408925
Hypotenuse (h)	40. 5732050533	133. 1141898074

Grand Gallery Design Triangle Dimensions:

Dimensions	Meters	Feet
Height (y)	20. 0268840561	65. 7050001840
Length (x)	41. 5862532491	136. 4378387438
Hypotenuse (h)	46. 1572588473	151. 4345762706

Distance to the Great Step:

Dimensions	Meters	Feet
Height (y)	37. 6309379726	123. 4610825872
Length (x)	78. 1414478731	256. 3695796363
Hypotenuse (h)	86. 7304639006	284. 5487660780

Angle of the Grand Gallery:

Diagonal	Radian	Radian	Degree
Angle A	π/7	0. 4487989505	25. 7142857143
Angle B	5π/14	1. 1219973763	64. 2857142857
Angle C	π/2	1. 5707963268	90

Chamber Design Radius:

Design Radius	Meters	Feet
Chamber	13. 3512560374	43. 8033334560
King's Chamber	11. 5857857828	38. 0111082114
Queen's Chamber	10. 7068760368	35. 1275460524
Difference King-Queen	0. 8789097461	2. 8835621590

Subterranean Chamber:

Subterranean Chamber	Meters	Feet
Depth from ground	32. 6443800006	107. 1009842540
Distance to the top of Py.	179. 3468920754	588. 4084385675
Length	14. 1638656558	46. 4693755113
Width	8. 1610950002	26. 7752460635

Queen's Chamber

Queen's chamber	Meters	Feet
Height	6. 2327280644	20. 4485828883
Apex y-value	1. 5523349271	5. 0929623594
Apex x-value	2. 6862139090	8. 8130377593
Apex hypotenuse	3. 1024972024	10. 1787965959
Apex total width	5. 37242781810	17. 6260755187
Apex max height	6. 2327280644	20. 4485828883
Wall height	4. 6803931372	15. 3556205290
Width North-South	5. 2381171226	17. 1854236307
Length East-West	5. 8064076222	5. 8064076222
Passageway height	1. 1925890027	3. 9126935783
Corridor height	1. 7100339784	5. 6103476981
Corridor width	1. 0744855636	3. 5252151037
Niche width	1. 5919305393	5. 2228692235
Niche height	4. 6803931372	15. 3556205290

Angles of Queen's Chamber

Queen's chamber	Radian	Radian	Degree
Roof angle	$atan\left(\frac{6 \cdot tan(\pi/7)}{5}\right)$	0. 5240031362	30. 0231681552
Complement	$atan\left(\frac{5}{6 \cdot tan(\pi/7)}\right)$	1. 0467931906	59. 9768318448
Right angle	$\pi/2$	1. 5707963268	90
North Shaft	$3\pi/14$	0. 6731984258	38.5714285714
South Shaft	$3\pi/14$	0. 6731984258	38.5714285714

The Niche:

Niche	Meters	Feet
Height	4. 6803931372	15. 3556205290
Width	1. 5919305393	5. 2228692235
Bottom height	1. 7100339784	5. 6103476981
Offset from Ceiling C.	0. 5372427818	1. 7626075519
Upper height	2. 9703591588	9. 7452728308
Corbel 1 height	0. 8550169892	2. 8051738491
Corbel 1 width	1. 3233091484	4. 3415654476
Corbel 2 height	0. 7051140565	2. 3133663272
Corbel 2 width	1. 0546877575	3. 4602616717
Corbel 3 height	0. 7051140565	2. 3133663272
Corbel 3 width	0. 7860663666	2. 5789578957
Corbel 4 height	0. 7051140565	2. 3133663272
Corbel 4 width	0. 5174449757	1. 6976541198
Corbel side difference	0. 1343106955	0. 4406518880

Grand Gallery Angles:

Diagonal	Radian	Radian	Degree
Angle A	π/7	0. 4487989505	25. 7142857143
Angle B	5π/14	1. 1219973763	64. 2857142857
Angle C	π/2	π/2	90

Grand Gallery:

Grand Gallery	Meters	Feet
Width	2.1489711272	7.0504302075
Corridor width	1.0744855636	3.5252151037
Roof width	1.0744855636	3.5252151037
East ledge width	0.5372427818	1.7626075519
West ledge width	0.5372427818	1.7626075519
Corbel width	0.0767489688	0.2518010788
Height	8.5958845089	28.2017208299
Corbel starting level	2.2947069646	7.5285661569
Height of the Great Step	38.2882978576	125.6177751233

King's Chamber:

King's Chamber	Meters	Feet
Height	5.8064076222	19.0498937736
Width	5.2381171226	17.1854236307
Length	10.4634124036	34.3287808518
Hypotenuse (H–W)	7.8199897996	25.6561345131
Hypotenuse (H–L)	11.9665102935	39.2602043749

King's Shaft Angles:

King's Shafts	Radians	Radians	Degrees
North Shaft A	$tan^{-1}\left(\frac{1-sin\,\pi/14}{1+sin\,\pi/14}\right)$	0.5664445808	32.4548838093
North Shaft B	$tan^{-1}\left(\frac{1+sin\,\pi/14}{1-sin\,\pi/14}\right)$	1.0043517460	57.5451161907
South Shaft	$\pi/4$	0.7853981634	45

Distance Between Pyramids:

Distance Between	Meters	Feet
Pyramids 1 and 2 centers	507. 2696142849	1, 664. 2703880738
Pyramids 1 and 2 corners	188. 9193741240	619. 8142195671
Pyramids 2 and 3 centers	472. 3280315282	1, 549. 6326493707
Pyramids 2 and 3 corners	401. 0318422338	1, 315. 7212671714
Pyramids 1 and 3 centers	970. 5751388622	3, 184. 3016366869
Pyramids 1 and 3 corners	896. 7344603769	2, 942. 0421928374

Pathway vertical height constant in the Unit circle

Pathway	Unit Circle Constant	Unit Circle Constant
Vertical height constant	0. 0099382417	0. 0099382417

Pathway vertical height constant in the Great Pyramid

Pathway	Meters	Feet
Vertical height constant	1. 1925890027	3. 9126935783

Measures of the Boss

Dimensions	Centimeters	Inches
Radius 1	10. 2704609520	4. 0434885638
Radius 2 (not visible)	12. 5558535152	4. 9432494154
Radius 3	15. 3497937660	6. 0432258921
Outer Vertical Height	18. 7654442108	7. 3879701617
Inner Vertical Height	12. 5558535152	4. 9432494154
Horizontal Height	2. 4460777637	0. 96302274163
Width of the Brim	5. 0793328140	1. 9997373283
Hypotenuse of the Brim	5. 6376341014	2. 2195409848
Boss outer radius	15. 3497937660	6. 0432258921
Boss outer diameter	30. 6995875319	12. 0864517842
Boss inner radius	10. 2704609520	4. 0434885638
Boss inner diameter	20. 5409219039	8. 0869771275
Endpoint hypotenuse	5. 0793328140	1. 9997373283
Endpoint side x	4. 9519833356	1. 9495997384
Endpoint side y	1. 1302578816	0. 4449834180
Inner base sidelength	10. 0129590530	3. 9421098634
Inner base width	20. 0259181061	7. 8842197268
Outer base sidelength	14. 9649423887	5. 8917096018
Outer base width	29. 9298847774	11. 7834192037
Outer Center from base	2. 7939402508	1. 0999764767
Inner Center from base	1. 8694097579	0. 7359880937

Angles of the Boss:

Angle	Radian	Radian	Degree
Endpoint Angle	$\pi/14$	0.2243994753	12.8571428571
Complement	$3\pi/7$	1.3463968515	77.1428571429
Rim angle	$\pi/7$	0.4487989505	25.7142857143
Complement	$5\pi/14$	1.1219973763	64.2857142857
Base angle	$tan^{-1}\left(\frac{tan\,\pi/7}{sin\,\pi/14}\right)$	1.1379508728	65.1997823044
Complement	$tan^{-1}\left(\frac{sin\,\pi/14}{tan\,\pi/7}\right)$	0.4328454540	24.8002176956

Dimensions of Capstone

Outside measures of the Capstone

Basic outside measures		
Measure	**Meter**	**Feet**
Height	1. 8390691329	6. 0336913810
Ground Elevation	144. 8634429418	475. 2737629325
Outer sidelength	1. 4666086938	4. 8117083131
Outer slant height	2. 3522577105	7. 7173809399
Inner sidelength	1. 4378421466	4. 7173298772
Inner slant height	2. 3344304047	7. 6588924037
Outer width	2. 9332173877	9. 6234166262
Inner width	2. 8756842931	9. 4346597544
Partition measures		
Side A	1. 8390691329	6. 0336913810
Side B	1. 4378421466	4. 7173298772
Side C	0. 0287665473	0. 0943784359
Perimeter of the base		
Inner Perimeter	11. 7351262799	38. 5010704721
Outer Measure	11. 7328695507	38. 4936665049
Difference	0. 0022567292	0. 0074039672

Outside measures of the Capstone

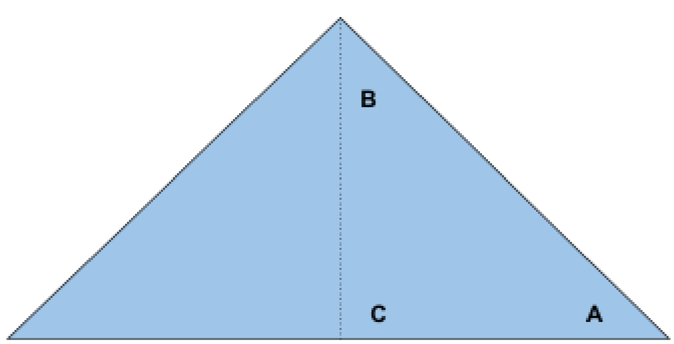
Diagonal measures		
Side A	1.8390691329	6.0336913810
Side B	2.0740979055	6.8047831546
Side C	2.7720132390	9.0945316242
Diagonal width	4.1481958110	13.6095663092
Total Dia. Slant Height	5.5440264781	18.1890632483

Measures of the 7 Circle in the Capstone:

Circle	**Radius** (m)	**Diameter** (m)
1	0.3347438639	0.6694877277
2	0.6527022726	1.3054045452
3	0.9379314640	1.8758629279
4	1.1761288552	2.3522577105
5	1.3553502346	2.7107004693
6	1.4666086938	2.9332173877
7	1.5707963268	3.0086505382

Outside angles for the 8-sided pyramid capstone

Outer side angle A			
Angle	**Radian**	**Radian**	**Degree**
A	$2\pi/7$	0. 8975979010	51. 4285714286
B	$3\pi/14$	0. 6731984258	38. 5714285714
C	$\pi/2$	1. 5707963268	90
Inner side angle A: at the mid-side partition			
A	$cot^{-1}\left(cos\left(\frac{3\pi}{14}\right)\right)$	0. 9072323456	51. 980584438
B	$tan^{-1}\left(cos\left(\frac{3\pi}{14}\right)\right)$	0. 6635639812	38. 0194155620
C	$\pi/2$	1. 5707963268	90
Inner and outer angle differences			
A	0. 0096344445	0. 0096344445	0. 5520130094
B	0. 0096344445	0. 0096344445	0. 5520130094
Diagonal side angle A			
A	$tan^{-1}\left(\frac{1+sin(\pi/14)}{\sqrt{2}\cdot cos(\pi/14)}\right)$	0. 7254092153	41. 5628864579
B	$tan^{-1}\left(\frac{\sqrt{2}\cdot cos(\pi/14)}{1+sin(\pi/14)}\right)$	0. 8453871115	48. 4371135421
C	$\pi/2$	1. 5707963268	90



Dimensions of Pyramid Two: GRP2

Outside measures

Dimension	Meter	Feet
Height	143. 6938615366	471. 4365535977
Sidelength	108. 116264148	354. 7121527175
Width	216. 2325282966	709. 4243054350
Diagonal Sidelength	152. 8994870716	501. 6387371116
Diagonal Width	305. 7989741432	1, 003. 2774742233
Slant height	179. 8250605913	589. 9772329112
Diagonal Slant height	209. 8241620740	688. 3994818701
Perimeter of the base	864. 9301131863	2, 837. 6972217399

Outside angles for an 4-sided pyramid, with side angle A

Outer side angle A			
Angle	**Radian**	**Radian**	**Degree**
A	$tan^{-1}\left(\frac{sin(\pi/14)+cos(\pi/14)}{sin(5\pi/14)}\right)$	0. 9257565309	53. 0419420758
B	$tan^{-1}\left(\frac{sin(5\pi/14)}{sin(\pi/14)+cos(\pi/14)}\right)$	0. 6450397959	36. 9580579242
C	$\pi/2$	1. 5707963268	90
Diagonal side angle A			
A	$tan^{-1}\left(\frac{sin(\pi/14)+cos(\pi/14)}{\sqrt{2} \cdot sin(5\pi/14)}\right)$	0. 7543702553	43. 2222318185
B	$tan^{-1}\left(\frac{\sqrt{2} \cdot sin(5\pi/14)}{sin(\pi/14)+cos(\pi/14)}\right)$	0. 8164260715	46. 7777681815
C	$\pi/2$	1. 5707963268	90

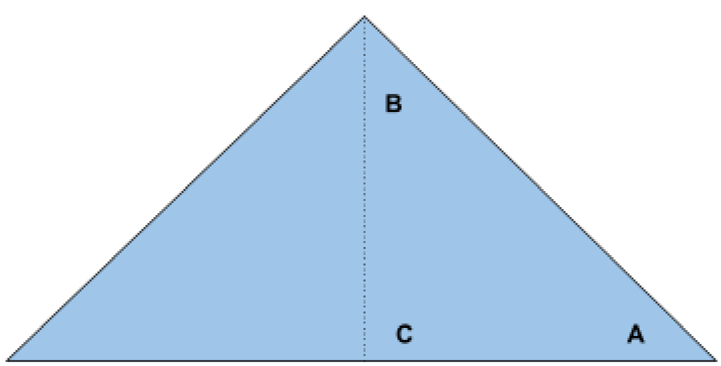
Dimensions of Pyramid Three: GRP3

Outside measures of the Pyramid 3

Dimensions	Meters	Feet
Height	66. 0867924592	216. 8201852336
Sidelength	52. 7024583428	172. 9083278963
Inner Sidelength	51. 6687349199	169. 5168468501
Partition depth	1. 0337234229	3. 3914810462
Hypotenuse of partition	52. 7125952642	172. 9415855125
Width	105. 4049166856	345. 8166557926
Inner Width	103. 3374698399	339. 0336937003
Diagonal Sidelength	74. 5325313588	244. 5293023582
Diagonal Width	149. 0650627176	489. 0586047165
Slant height	84. 5281802295	277. 3234259500
Inner Slant height	83. 8875575146	275. 2216453892
Diagonal Slant height	99. 6120593517	326. 8112183456
Perimeter of the base		
Inner Perimeter	421. 7007621138	1, 383. 5326841002
Outer Measure	421. 6196667424	1, 383. 2666231706
Difference	0. 0810953714	0. 2660609297

Outside angles for the 8-sided pyramid 3

Outer side angle A			
Angle	**Radian**	**Radian**	**Degree**
A	$2\pi/7$	0. 8975979010	51. 4285714286
B	$3\pi/14$	0. 6731984258	38. 5714285714
C	$\pi/2$	1. 5707963268	90
Inner side angle A: at the mid-side partition			
A	$cot^{-1}\left(cos\left(\frac{3\pi}{14}\right)\right)$	0. 9072323456	51. 980584438
B	$tan^{-1}\left(cos\left(\frac{3\pi}{14}\right)\right)$	0. 6635639812	38. 0194155620
C	$\pi/2$	1. 5707963268	90
Inner and outer angle differences			
A	0. 0096344445	0. 0096344445	0. 5520130094
B	0. 0096344445	0. 0096344445	0. 5520130094
Diagonal side angle A			
A	$tan^{-1}\left(\frac{1+sin(\pi/14)}{\sqrt{2}\cdot cos(\pi/14)}\right)$	0. 7254092153	41. 5628864579
B	$tan^{-1}\left(\frac{\sqrt{2}\cdot cos(\pi/14)}{1+sin(\pi/14)}\right)$	0. 8453871115	48. 4371135421
C	$\pi/2$	1. 5707963268	90



Related Applications

All applications listed below were developed and programmed by the author and are available exclusively on the **Apple App Store**. Several were essential in supporting the research, visualization, and mathematical modeling found in this work.

Unreleased Tool

1. **Private Geometric Design Tool (Unpublished)**
   A proprietary application developed by the author using Apple's Swift programming language. This internal tool was essential for generating many of the 2D geometric patterns and schematics featured in this work. Though unpublished, it was instrumental in visualizing and refining key design elements throughout the research. One of the images produced with this tool appears on the cover page of this document.

Primary Application

2. **Great Pyramids**
   https://apps.apple.com/app/id1485932696
   A 3D visualization tool derived directly from this research. It allows users to explore accurate reconstructions of the Giza pyramid complex from multiple viewpoints.

Mathematical and Design Tools

3. **SciPro Math**
   https://apps.apple.com/app/id1297822400
   Used throughout the research for advanced mathematical calculations involving geometry, ratios, and trigonometry.
4. **Color As Hue**
   https://apps.apple.com/app/id1493866452
   Assisted in experimenting with color harmonies and their application in visual design related to pyramid models.
5. **Coloring Studio**
   https://apps.apple.com/app/id1494974592
   Used to produce many of the 2D artistic renderings and color overlays within geometric designs.
6. **Scheme Hue**
   https://apps.apple.com/app/scheme-hue/id1536839563
   A tool for creating structured color palettes. Used to explore design consistency in the paper's figures.
7. **Scheme Color**
   https://apps.apple.com/app/scheme-color/id1527017909
   Used in refining visual presentations of mathematical models and diagrams.

Other Applications by the Author
(Not directly related to this research)

8. **Chem Elements**
   https://apps.apple.com/app/id1501282198
   An educational tool focused on exploring the periodic table and chemical elements.

9. **DominoPointsPro**

   https://apps.apple.com/app/DominoPointsPro/id6474100915

   A digital scoring system for the strategic game of dominoes.

Notes on Sources and Acknowledgments

While *The Great Ratio* is the result of original research, mathematical logic, and geometric deduction, it would be incomplete not to acknowledge the many thinkers, creators, and researchers whose public work, while not directly cited or used in the derivations, helped shape the intellectual atmosphere that encouraged this discovery. Their content sparked questions, invited comparison, or simply opened new paths of inquiry.

This section honors that inspiration:

YouTube Video & Other Online Sources

- ***Giza Pyramids – Ultimate Geometric Solution in the Hebrew Bible***
  This early video served as an initial inspiration. It introduced the **heptagon** as a conceptual basis and used **120** as a circle radius. Despite inconsistencies and inaccuracies, it pointed the research toward geometric exploration, ultimately helping uncover the **dodecagon** as the correct foundational shape.

  Giza Pyramids – Ultimate Geometric Solution in the Hebrew Bible.

  YouTube, uploaded by Dan Israel,

  https://www.youtube.com/watch?v=wEK0cLd5LPU

- **Samuel Laboy – *A Civil Engineer Looks at the Great Pyramid***
  Though the video has become hard to find, Laboy's engineering-based perspective offered unique insights into construction logic and layout, stimulating thought from a civil engineering point of view.

Content Creators and Channels

- **Brien Foerster** – Known for deep exploration of ancient sites and anomalous features in stonework that challenge conventional timelines.
- **Bright Insight** – Provided motivational content questioning mainstream history, encouraging open-minded analysis.
- **Ancient Architects** – Offered well-researched perspectives on architecture, geometry, and symmetry in ancient constructions.

- **UnchartedX** – Focused on evidence of advanced stonework and lost technologies, fueling the idea of precision in ancient times.
- **History for Granite** – Detailed, often technical, analysis on the materials, methods, and logic behind ancient monuments.
- **Funny Old World** – A thought-provoking channel that blends curiosity, mystery, and a deep sense of wonder about human origins and the ancient past.

Independent Researchers & Thinkers

- **Randall Carlson** – Geologist and ancient mystery researcher whose broad approach to sacred geometry and cataclysmic cycles inspired multidimensional thinking.
- **Graham Hancock** – Journalist and author advocating for the possibility of lost ancient civilizations with advanced knowledge.
- **Christopher Dunn** – Engineer and author of *The Giza Power Plant*, whose hypotheses about technological precision in pyramid construction brought attention to the feasibility of advanced ancient engineering.
- Special credit is also due to **Erich von Däniken**, whose books and video presentations served as an early source of curiosity and inspiration. While the findings and conclusions of this paper are based on independent analysis and mathematical reasoning, his work helped stimulate the initial questions that led to a deeper investigation of the Great Pyramid and its possible design intentions.

Other Informational Resources

- The completion of *The Great Ratio* would not have been possible without the practical tools and resources that supported both the writing and the analytical work.
- I would like to acknowledge **Google Docs** and **Google Sheets** for providing the essential platforms used throughout this project. These tools were instrumental in composing the manuscript and in performing the complex calculations required to develop and test the mathematical relationships described herein. While such work could theoretically be done by hand, the efficiency and precision offered by these digital tools made the process feasible.
- Special thanks are also due to **Swift**, the programming language developed by **Apple**, which played a key role in this research. Custom-built applications written in Swift allowed for dynamic testing of geometric and mathematical theories. Additionally, many of the high-accuracy images presented throughout the text

were created using Swift-based visualizations, which helped confirm results and communicate them more clearly.

- **Wikipedia & Open Encyclopedia Entries** – Used only for cross-checking conventional measurements and terminology.
- **Pinterest** – Occasionally browsed for visual references, diagrams, and artistic interpretations of the pyramids and ancient geometry. While not used for data or analysis, it served as a platform to stimulate visual thinking and creative exploration.
- **3D modeling and rendering** performed using **Blender**, an open-source 3D creation suite. (https://www.blender.org)
- **ChatGPT (OpenAI)** – While this research and its findings are the result of original thought, ChatGPT, through its capacity for brainstorming and assisting with various aspects of research and logical structuring, provided support in refining the clarity and articulation of ideas, helping streamline complex concepts. Though not a direct contributor to the discoveries themselves, its role in facilitating conceptual exploration was valuable.
- Many helpful discussions about this research took place at **Librería Cuesta** in **Santo Domingo, Dominican Republic**, a place where great ideas and conversations flourished among friends. I am grateful for the numerous exchanges that took place there, particularly with those who are mentioned in this work.

To Friends and Family

- I would also like to thank **Peter Schaub** for performing some of the proofreading work. His input helped improve the clarity and polish of several sections of the manuscript.
- Another source of inspiration and encouragement was my dear friend, **Dr. Amado Reyes**, a graduate of **Tulane University**, and a respected professor at the **Universidad Autónoma de Santo Domingo (UASD)** — the oldest university in the Americas. His insight, encouragement, and friendship were of great value throughout the development of this work. **Rest in peace, my friend.**
- To my boss and dear friend from college, **Bladimir Mercedes**, for providing stable employment and financial support during my investigations. Your generosity and belief in my work have been invaluable.
- To my family —
  To my brother, **Juan Pablo Campusano Acosta**,
  To my late mother, **Ana M. Acosta De Campusano**, my angel,
  To my father, **Luis Campusano Florentino**,
  And to my entire family and extended family,

Thank you for your unwavering support and understanding as I dedicated myself to this solitary endeavor. Your love and patience sustained me through it all.

- Lastly, I owe my deepest thanks to **Rafael Alfredo De La Hoz**, my dear friend, whose unwavering support and encouragement have been a constant source of inspiration. His belief in this project and in me has been one of the greatest gifts throughout the years.

These sources, whether by contrast, critique, or curiosity, helped shape the path toward the rediscovery of what this paper terms The Great Ratio. Though this research stands independently, it owes gratitude to the community of explorers and thinkers willing to ask difficult questions about the past.

Legal Notice