

# Khufu's Coffer

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## Abstract

*An analysis of Khufu's coffer dimensions and location, based on Petrie's measurements. The analysis suggests that it can not be 4<sup>th</sup> Dynasty, due to the formulas involved.*

**Keywords:** Egyptology, Giza, geometry, archaeogeometry,  $\pi$ ,  $\pi$ ,  $\varphi$ , golden ratio, plastic ratio  $\rho$ .

Best viewed and printed in colour.

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### Revision history:

1.0.0 19 September 2021 Initial version.

2.0.0 29 September 2021 Additions: diagonal of base, surface based on that, surface of inner base, sum of inner surfaces, areas of the other two diagonal planes, summary table, pictures, longest cross diagonal, volume of lid, diagonals of lid, volume of sphere.

## 1. Introduction

*"The language of Giza is mathematics."*

Robert Bauval

*"You will believe."*

The architects of Giza

This short document is an analysis of Khufu's coffin, as measured by Petrie. [1]

I did search (Google, Google Scholar, ResearchGate, Zenodo, Academia, SCIRP) to see if these results have been published before but could not find anything.

I have seen claims along the lines of "the outer volume is exactly twice the inner volume" but the numbers do not support "exact" here. Only close. There are other relationships that are better.

This document will be expanded if anything new surfaces. It is also likely to be incorporated into the upcoming (as of September 2021) Zep Tepi Mathematics 201, the sequel to Zep Tepi Mathematics 101 [2] (henceforth ZTM101).

### A note on style

I don't like the usual phrases "The current author" or "The present author." I will refer to myself in the first person, or frequently as "we," not because I am schizophrenic but I've been using that term since childhood, and it's even more relevant now. While investigating Giza, I have had constant help from sources unknown, and they deserve due credit. Tesla experienced the same phenomenon, and could not explain the source either.

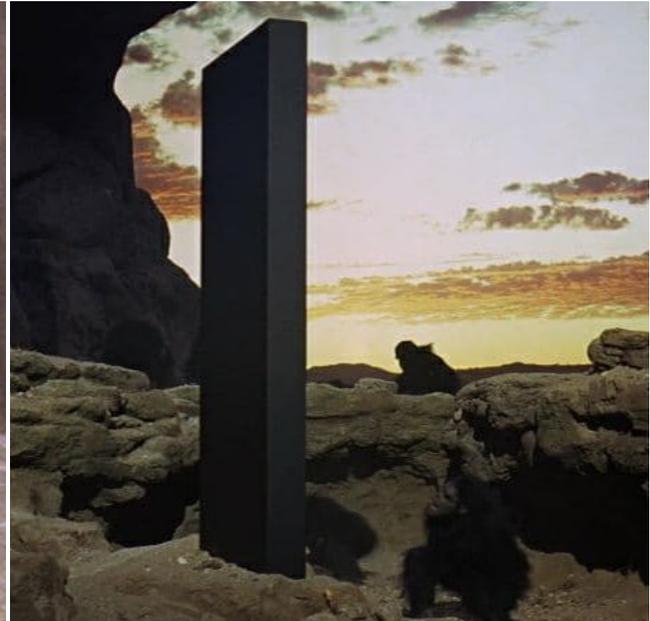
*"My brain is only a receiver. In the universe there is a core from which we obtain knowledge, strength, inspiration. I have not penetrated into the secrets of this core, but I know that it exists."*

Attributed to Nikola Tesla

The guides are my shepherd;  
 I shall not wonder.  
 They make me ponder plans,  
 and lead me above still waters.  
 They restore my hope.  
 They lead down the paths of mathematics  
 to admire them.  
 Even though I walk through the pyramids  
 among the shadow of death,  
 I will have no doubts:  
 for they are with me;  
 their  $\pi$  and their  $\varphi$   
 they comfort me.  
 And I shall dwell  
 in the house of Thoth  
 Forever.



Photo by Jon Bodsworth



The iconic monolith in Stanley Kubrick's film, "2001: A Space Odyssey"

Table 1: Evidence of engineering and intelligence.

## 2. Notation, accuracy and methodology

### 2.1 Notation

I take the royal cubit as  $\pi/6$  metres, to 4 decimal places. (*The Beautiful Cubit System*, Douglas 2019 [3]). While working on ZTM101 last year it became apparent they thought 3 or 4 decimals were accurate enough, so I have used that, and things “just work.”

Symbols used in this and other papers:

Symbol	Name	Approximate / practical value	% Accuracy to true
$\pi$	Archimedes' constant	3.1416	99.9998
$\acute{\pi}$	$\pi - 1$	2.1416	99.9997
e	Euler's number	2.7183	99.9993
$\phi$	Golden ratio	1.618 $\phi + 1 = \phi^2 = 2.618$	99.9979
$\rho$	Plastic number / ratio	1.3247 $\rho+1 = \rho^3 = 2.3247$	99.9986
Ⓒ	Royal cubit aka cubit	0.5236m $(\pi/6)$	
"	Petrie inches	0.025399977 m	

Table 2: Symbols, names and values

I use “cubit” for Royal cubit Ⓒ.

When Petrie took his measurements, his inch was 25.399977mm [4] rather than the current

25.4mm. To convert his inches to  $\mathcal{C}$ , I use a conversion factor of 20.61419189, from

$$\frac{0.5236}{0.025399977} = 20.61419189$$

Petrie concluded, based on his measurements of the King's Chamber, that the  $\mathcal{C}$  was  $20.620'' \pm 0.005''$ , which is 0.5236205259 to 0.5238745256 m.

Petrie took his measurements after at least one major (in 1303) and several lesser earthquakes ( *Sustainability problems of the Giza pyramids*, Hemeda and Sonbol [5] ), as well as the activities of the explosive Howard Vyse ( *Operations carried on at the pyramids of Gizeh in 1837*, Vyse and Perring [6] ). As a result, the walls could have shifted slightly. Also, everyone assumes the chamber was built 100% perfectly, which may not be true.

Comparing the 20  $\mathcal{C}$  length of the king's chamber for the different values of  $\mathcal{C}$ :

<i>Cubit m</i>	<i>Length m</i>	<i>Difference m</i>
0.5236000000	10.47200000	0.000000000
0.5236205259 (-0.005'')	10.47241052	0.000410520 $\approx$ 0.41 mm
0.5237475257 (20.62'')	10.47485051	0.002950514 $\approx$ 2.95 mm
0.5238745256 (+0.005'')	10.47749051	0.005490512 $\approx$ 5.49 mm

Table 3: King's chamber length for different cubit values

## 2.2 Accuracy

How accurate must things be? We have no idea what tools or technologies the builders had, what they considered "accurate" or "good enough," nor exactly how earthquakes or gunpowder and sledge-hammers have affected the relative positions over time. We can not assume that their standards were the same as ours. There is no such thing as perfect accuracy in building construction.

Note that "close" in context of this discussion refers to practical measurements on a building project using unknown instruments, not something on the scale of modern micro-electronics.

Because the distances are short (as opposed to on the plateau) I have shown results to more decimals than normal, but don't rely on them to prove anything. They typically get rounded.

## 3. Dimensions

Petrie measured the coffin thoroughly, in an attempt to prove or disprove some theories that were in vogue at the time. He measured according to spots every six inches vertically and horizontally. The results were then tabulated, an average for each dimension calculated, and the delta at each point listed.

The coffin, carved out of solid granite, is not perfect. There are variation of up to  $0.39''$  (9.9 mm) from the average in places. Petrie may even have gotten different results if he had measured every

3 inches, or every foot.

Petrie gives the coffer dimensions as:

Item	Petrie inches "	€ @ 0.5236m	m
Outer length	89.62	4.347490334	2.276345939
Outer width	38.50	1.867645368	0.9778991145
Outer height	41.31	2.003959224	1.04927305
Inner length	78.09	3.788166929	1.983484204
Inner width	26.81	1.30056032	0.6809733834
Inner depth	34.42	1.669723469	0.8742672083

Table 4: Petrie's measurements for the coffer

Apart from the height (and inner width) in €, nothing looks like a “nice” number. Yet there is logic in the numbers. We could note that the inner depth is  $\approx 1\frac{3}{5}\text{€}$ , and the outer length  $\approx 1+\sqrt{\varphi}$  metres.

Let us first deal with the existing claim regarding the ratio of outer volume to inner volume.

$$\frac{\text{outer volume}}{\text{inner volume}} = \frac{89.62 \times 38.50 \times 41.31}{78.09 \times 26.81 \times 34.42} = \frac{142534.7847}{72061.46762} = 1.977961169$$

which is close to 2.000 but could be better. The accuracy to 2.000 is only 98.898%.

With that out of the way, we can begin.

1. The width of 38.50" converts to 1.867645368 €. I suggest that the design intent was 1.87 €. The difference is 1.23mm.

What is special about 1.87? Firstly, it is the length of a digit in cm. [3]  $28 \times 1.87\text{cm} = 52.36\text{cm}$ .

Secondly, and more importantly, it is the rounded value of  $\pi\varphi/e$ .

$$\frac{\pi\varphi}{e} = \frac{3.14159265... \times 1.6180339887...}{2.718281828459...} = 1.870006134...$$

or

$$\frac{3.1416 \times 1.618}{2.7183} = 1.869958724...$$

So we can say that the width is  $(\pi\varphi/e)$  €.

Trying to convert the width to palms and fingers does not work:

$$38.5 \text{ " } = 1.867645368 \text{ € } = 0.9778991145 \text{ m}$$

$$\frac{97.78991145 \text{ cm}}{1.87} = 52.29407029 \text{ digits}$$

which leaves you with 0.294 digits (5.423mm) after assigning the 52 digits to cubits, palms, etc. So we clearly need to work in decimal cubits.

Because the digit is 1.87cm, we get a curious circular relationship if we ask “How many digits in

1.87 ƒ?"

$$\begin{aligned} 1.87 \text{ ƒ} &= 0.979132 \text{ m} \\ \frac{97.9132 \text{ cm}}{1.87 \text{ cm}} &= 52.36 \end{aligned}$$

2. The length of 89.62" converts to 4.347490334 ƒ. I would take the intent to be  $1.87 \times \rho^3$ .

$$1.87 \times 2.3247 = 4.347189 \quad (\text{accuracy to above is } 99.993\%)$$

Which can be written as

$$\frac{\pi \varphi \rho^3}{e}$$

A formula beautiful enough to rival Euler's identity. This is the key formula for the coffin, used for a length here, and later for area and volume.

3. The area of the base is then

$$\text{Area} = \text{width} \times \text{length} = 1.87 \times 1.87 \rho^3 = 1.87^2 \rho^3 = 8.12924343$$

or

$$\left(\frac{\pi \varphi}{e}\right)^2 \rho^3$$

Convert that to m<sup>2</sup>

$$8.12924343 \times 0.5236^2 = 2.2286888666$$

which is close to

$$\frac{\pi}{\sqrt{2}} = \frac{3.1416}{1.4142} = 2.221467968 \quad (99.676\% \text{ accurate.})$$

4. Petrie gives the height as 41.31", which converts to 2.003959224ƒ, so the target height was clearly 2ƒ.

5. The outer volume is then

$$\text{Volume} = \text{width} \times \text{length} \times \text{height} = 1.87 \times 1.87 \rho^3 \times 2 = 1.87^2 \rho^3 \times 2 = 16.25848686 \text{ ƒ}^3$$

or

$$\left(\frac{\pi \varphi}{e}\right)^2 2 \rho^3, \text{ or numerically twice the area of the base. The accuracy to } 10\varphi \text{ is } 99.517\%.$$

That converts to  $2.333882771 \text{ m}^3$ , or effectively  $2\frac{1}{3}\text{m}^3$ .

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6. The area of the inside length is

Area = length  $\times$  depth =  $78.06 \times 34.42 = 2686.8252$  , which converts to  $6.322761263\text{C}^2$ , which converts to  $1.733429007\text{m}^2$ .

This is effectively  $\sqrt{3} \text{ m}^2$ .  $1.733429007^2$  is  $3.004776121$ , so 99.9176% accurate.

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7. The inside width is  $26.81''$ , which converts to  $1.30056032 \text{ C}$ .

$$\frac{\sqrt{\pi^2 + \varphi^2}}{e} \approx 1.3$$


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8. The interior volume is

Volume = length  $\times$  width  $\times$  depth =  $78.06 \times 26.81 \times 34.42 = 72033.78361$  , which converts to  $8.22313241\text{C}^3$

$8.22$  is  $\pi\varphi^2$ , rounded. The values  $822$  and  $411$  are used in the Giza site plan. [2]

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9. The sum of the thickness of the four sides is

$5.67 + 5.87 + 5.89 + 5.82 = 23.25''$  , which converts to  $1.127863761\text{C}$ .

$\sqrt[4]{1.618} = 1.127832563$  , accuracy is 99.997%.

---

10. We do not have the coffin lid, but the design implies that it existed. Given the current dimensions, I would guess that the lid increased the outside height from  $2\text{C}$  to  $2.3247\text{C}$ , i.e.  $\rho^3$ .

$0.3247\text{C}$  is  $17\text{cm}$ , which is reasonable, given the coffin height.

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11. The total outer volume would then be

Outer volume = length  $\times$  width  $\times$  height =  $1.87 \times 1.87 \times \rho^3 \times \rho^3 = (1.87 \rho^3)^2$

or

$$\left( \frac{\pi \varphi \rho^3}{e} \right)^2$$

In other words, the volume is numerically the length squared.

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12. The value also rounds to  $e m^3$  (rounded).

$$\begin{aligned} (1.87 \rho^3)^2 &= 18.8980522 \mathcal{C}^3 \\ e m^3 &= 2.7183 \div 0.5236^3 = 18.9364459 \mathcal{C}^3 \end{aligned} \quad (99.797\% \text{ accurate.})$$

13. Similarly, the area of the short side with lid is  $1.87\rho^3$ , numerically the same as the length.

$$\left( \frac{\pi \varphi \rho^3}{e} \right)$$

14. So short side  $\rightarrow$  length  $\rightarrow$  volume all revolve around  $\pi\varphi\rho^3/e$ .

15. We can write the volume in terms of the irrationals:

$$\begin{aligned} \text{Volume} &= \text{length} \times \text{breadth} \times \text{height} \\ &= \frac{\pi \varphi}{e} \rho^3 \times \frac{\pi \varphi}{e} \times \rho^3 \\ &= \left( \frac{\pi \varphi \rho^3}{e} \right)^2 \mathcal{C}^3 \end{aligned}$$

It's rather curious the volume is also a square: length squared is volume, and area of short end with lid squared is volume.

Another curiosity is the logarithm using  $\sqrt{5}$  as base:

$$\begin{aligned} \left( \frac{\pi \varphi \rho^3}{e} \right)^2 \mathcal{C}^3 &= (1.87 \times 2.2347)^2 = 18.8980522 \\ 100 \cdot \log_{2.236}(18.8980522) &= 365.2417869 \approx \text{Days in year} \end{aligned}$$

My guides have been insisting for a long time that I should investigate logarithms. The question is, which base? I've tried the obvious (10 and  $e$ ), and the usual suspects ( $\varphi$ ,  $\varphi^2$ ,  $\pi$ , 2), but nothing interesting has popped up until now.

16. The diagonal of the base is then

$$\begin{aligned} \text{Diagonal} &= \sqrt{\text{length}^2 + \text{breadth}^2} \\ &= \sqrt{(1.87 \times 2.3247)^2 + 1.87^2} \\ &= \sqrt{22.3949522} \\ &= 4.732330525 \\ &\approx 3 + \sqrt{3} \mathcal{C} \end{aligned}$$

$$1.732330525^2 = 3.000969049$$

17. If we extend that diagonal up vertically to the top of the lid, then the area of that surface is

$$\begin{aligned} \text{Area} &= \text{length} \times \text{height} \\ &= 4.732330525 \times 2.3247 \\ &= 11.00124877 \\ &\approx 11 \text{ } \mathcal{C}^2 \end{aligned}$$

18. The area of the inner base is

$$\begin{aligned} \text{Area} &= \text{length} \times \text{width} \\ &= 78.09 \text{ ''} \times 26.81 \text{ ''} \\ &= 2093.5929 \text{ ''}^2 \\ &= 4.926739592 \text{ } \mathcal{C}^2 \end{aligned}$$

$$\frac{\pi^2}{2} = \frac{3.1416^2}{2} = 4.93482528 \text{ , or accuracy 99.836\%}.$$

19. The sum of the inner surfaces is

$$\begin{aligned} \text{Area} &= \text{base} + 2 \times \text{long side} + 2 \times \text{short side} \\ &= (78.09 \times 26.81) + 2 \times (78.09 \times 34.42) + 2 \times (26.81 \times 34.42) \\ &= 9313.3471 \text{ ''}^2 \\ &= 21.91659892 \text{ } \mathcal{C}^2 \\ &= 6.008588133 \text{ } m^2 \\ &\approx 6 \text{ } m^2 \end{aligned}$$

The cubit value is also close to  $7 \times 3.1416$ .

20. The diagonal of the short end plus lid is

$$\begin{aligned} \text{Diagonal} &= \sqrt{\text{breadth}^2 + \text{height}^2} \\ &= \sqrt{1.87^2 + 2.3247^2} \\ &= \sqrt{8.90113009} \\ &= 2.983476176 \text{ } \mathcal{C} \end{aligned}$$

If we then imagine a surface, with that line as base, extending for the length of the coffin, it's area is

$$\begin{aligned} \text{Area} &= \text{length} \times \text{base} \\ &= 1.87 \times 2.3247 \times 2.983476176 \\ &= 12.96973481 \text{ } \mathcal{C}^2 \\ &= 3.555743068 \text{ } m^2 \end{aligned}$$

$$\pi + \sqrt{2} = 2.1416 + 1.4142 = 3.5558 \text{ , accuracy to above is 99.998\%}$$

21. The diagonal of the long side plus lid is

$$\begin{aligned} \text{Diagonal} &= \sqrt{\text{length}^2 + \text{height}^2} \\ &= \sqrt{(1.87 \times 2.3247)^2 + 2.3247^2} \\ &= \sqrt{24.30228229} \\ &= 4.929734505 \text{ } \mathcal{C} \end{aligned}$$

If we then imagine a surface, with that line as base, extending for the width of the coffin, its area is

$$\begin{aligned} \text{Area} &= \text{base} \times \text{depth} \\ &= 4.929734505 \times 1.87 \\ &= 9.218603525 \text{ } \mathcal{C}^2 \\ &= 2.527344318 \text{ } m^2 \end{aligned}$$

$$\varphi^{-1} + 0.5236^{-1} = 0.618 + 1.909854851 = 2.527854851, \text{ accuracy to above is } 99.9798\%$$

$$\varphi^{-1} + 0.5236^{-1} = \frac{1}{\varphi} + \frac{6}{\pi}$$

22. The diagonal from a top corner of the lid to the opposite bottom corner, is given by

$$\begin{aligned} \text{Diagonal} &= \sqrt{(\text{base diagonal})^2 + \text{height}^2} \\ &= \sqrt{(\text{length}^2 + \text{width}^2) + \text{height}^2} \\ &= \sqrt{(1.87 \times 2.3247)^2 + 1.87^2 + 2.3247^2} \\ &= 5.272492986 \end{aligned}$$

$$4 + \sqrt{1.618} = 4 + 1.272006289 = 5.272006289$$

Accuracy between the two numbers is 99.99%.

23. The volume of the lid (which can be viewed as a monolith) has an interesting property:

$$\begin{aligned} \text{Volume} &= \text{length} \times \text{breadth} \times \text{height} \\ &= (1.87 \times 2.3247) \times 1.87 \times 0.3247 \\ &= 2.639565342 \text{ } \mathcal{C}^3 \\ &= 0.3789058679 \text{ } m^3 \end{aligned}$$

$$0.3789058679^{-1} = 2.639177919$$

The correlation between those two numbers (2.639...) is 99.985%

So within the limits of manufacture, the volume in  $\mathcal{C}^3$  is the inverse of the volume in  $m^3$ .

24. The diagonal of the short side of the lid is

$$\begin{aligned}
 \text{Diagonal} &= \sqrt{\text{width}^2 + \text{height}^2} \\
 &= \sqrt{1.87^2 + 0.3247^2} \\
 &= \sqrt{3.60233009} \\
 &\approx \sqrt{\frac{3 \times 3.1416}{2.618}} \\
 &\approx \sqrt{\frac{3\pi}{\varphi}}
 \end{aligned}$$

25. The diagonal of the long side of the lid is

$$\begin{aligned}
 \text{Diagonal} &= \sqrt{\text{length}^2 + \text{height}^2} \\
 &= \sqrt{(1.87 \times 2.3247)^2 + 0.3247^2} \\
 &= \sqrt{19.00348229} \\
 &\approx \sqrt{19}
 \end{aligned}$$

26. A sphere with the same volume would be:

$$\begin{aligned}
 \text{Volume} &= 18.8980522 \text{ } \mathcal{C}^3 \\
 &\text{convert to } m^3 \\
 &= 18.8980522 \times 0.5236^3 m^3 \\
 &= 2.712788639 m^3 \\
 \text{volume of sphere} &= \frac{4}{3} \pi r^3 \\
 \therefore \frac{4}{3} \pi r^3 &= 2.712788639 \\
 \therefore r^3 &= \frac{3 \times 2.712788639}{4 \times \pi} \\
 \therefore r &= \sqrt[3]{0.6476290677} \\
 \therefore r &= 0.8651845943 \\
 \therefore \text{diameter} &= 1.730369189 m \\
 &\approx \sqrt{3} m
 \end{aligned}$$

Correlation to  $\sqrt{3}$  (1.732) is 99.9%

This is numerically equivalent to the inside length area.

## 4. Location

We don't know the original placement of the coffin within the king's chamber.

However, while it had clearly been moved when Petrie measured it, the numbers may imply "yes, but not much."

An estimate of the mass, using a typical / average granite density of 2750 kg/m<sup>3</sup>

$$\begin{aligned}
 \text{outer volume} - \text{inner volume} &= (89.62 \times 38.5 \times 41.31) - (78.06 \times 26.81 \times 34.42) = 70501.00109 \text{ " }^3 \\
 &= 8.048155 \text{ } \text{C}^3 \\
 &= 1.1553 \text{ } m^3 \\
 &= 3177 \text{ } kg
 \end{aligned}$$

So, not too easy to move around, even without the lid.

Petrie gives the distances from the corners (NE, NW and SW, top and base) to the north and west walls as

	<i>NE to N wall</i>	<i>NW to N wall</i>	<i>NW to W wall</i>	<i>SW to S wall</i>
Top	47.70	48.90	53.34	56.50
Base	48.35	50.06	53.32	56.54

*Table 5: Petrie's distances to the nearest walls*

Dealing with the north side first, the average of the four values is 48.7525", which converts to 2.364996904C. I would argue, given the use of  $\rho^3$  in the length, that the original distance, if it was set "precisely" at all, was 2.3247C, or  $\rho^3$ C. The difference is 2.1cm.

The average distance to the west wall is 54.925", which converts to 2.664426541C.

Similarly, I would argue for an original value of 2.618C, or  $\varphi^2$ C. The difference is 2.43cm.

The current position gives a north value accuracy of 98.296%, and the west value accuracy of 98.2575%.

### 5. Summary

Item	Formula	Value
Width	$\frac{\pi\varphi}{e} \text{ } \mathbb{C}$	1.87 $\mathbb{C}$
Length	$\frac{\pi\varphi\rho^3}{e} \text{ } \mathbb{C}$ or $\approx \frac{8e}{5} \text{ } \mathbb{C}$	4.347 $\mathbb{C}$
Area of base	$\left(\frac{\pi\varphi}{e}\right)^2 \rho^3 \text{ } \mathbb{C}^2$ or $\frac{\pi}{\sqrt{2}} \text{ } \text{m}^2$	8.129 $\mathbb{C}^2$ or 2.22 $\text{m}^2$
Height without lid		2 $\mathbb{C}$
Outer volume, without lid	$\left(\frac{\pi\varphi}{e}\right)^2 2\rho^3 \text{ } \text{m}^3$	$2\frac{1}{3} \text{ } \text{m}^3$
Area of inside length	$\sqrt{3} \text{ } \text{m}^2$	
Inside width	$\frac{\sqrt{\pi^2 + \varphi^2}}{e} \text{ } \mathbb{C}$	1.3 $\mathbb{C}$
Interior volume	$\pi\varphi^2 \text{ } \mathbb{C}^2$	8.22 $\mathbb{C}^2$
Sum of wall thickness	$\sqrt[4]{\varphi} \text{ } \mathbb{C}$	1.1278 $\mathbb{C}$
Height with lid (best guess)	$\rho^3 \text{ } \mathbb{C}$	2.3247 $\mathbb{C}$
Total outer volume	$\left(\frac{\pi\varphi\rho^3}{e}\right)^2 \text{ } \mathbb{C}^2$ or $e \text{ } \text{m}^3$	18.898 $\mathbb{C}^3$
Diameter of sphere with same volume		$\sqrt{3} \text{ } \text{m}$
Area of short side with lid	$\frac{\pi\varphi\rho^3}{e} \text{ } \mathbb{C}^2$ or $\approx \frac{8e}{5} \text{ } \mathbb{C}^2$	4.347 $\mathbb{C}^2$
Diagonal of base	$3 + \sqrt{3} \text{ } \mathbb{C}$	4.732 $\mathbb{C}$
Plane on base diagonal		11 $\mathbb{C}^2$
Area of inner base	$\frac{\pi^2}{2} \text{ } \mathbb{C}^2$ or $3 \zeta(2) \text{ } \mathbb{C}^2$	4.93 $\mathbb{C}^2$
Sum of inner surfaces	Close to $7\pi \text{ } \mathbb{C}^2$	6 $\text{m}^2$
Inner plane on short edge diagonal	$\pi + \sqrt{2} \text{ } \text{m}^2$	3.5557 $\text{m}^2$
Inner plane on long side diagonal	$\frac{1}{\varphi} + \frac{6}{\pi} \text{ } \text{m}^2$	2.527 $\text{m}^2$
Longest cross diagonal	$4 + \sqrt{\varphi}$	5.272 $\mathbb{C}$
Volume of the lid	$\text{Volume}_e = \frac{1}{\text{Volume}_m}$	2.6396 $\mathbb{C}^3$
Probable distance to north wall	$\rho^3 \text{ } \mathbb{C}$	2.3247 $\mathbb{C}$
Probable distance to west wall	$\varphi^2 \text{ } \mathbb{C}$	2.618 $\mathbb{C}$

Table 6: Summary of results

## 6. Conclusion

When measured using cubits or metres, Khufu's coffin reveals startling use of famous mathematical constants, which, as far as we know, the 4<sup>th</sup> dynasty did not know. The dimensions are also ingenious in their interplay.

We must thus either accept that these dimensions are pure chance, or they are not random, and the coffin is not 4<sup>th</sup> dynasty. We know that the dimensions of the coffin are out of sync with normal ratios for the typical dynastic sarcophagus.

## 7. Acknowledgements

Thanks as always to my "guides," whoever or whatever they are, for their constant prompting and odd ideas, which frequently lead to shocking discoveries and amazed laughter. I wish I knew them.

Thanks to the team behind the Libertinus fonts [7].

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