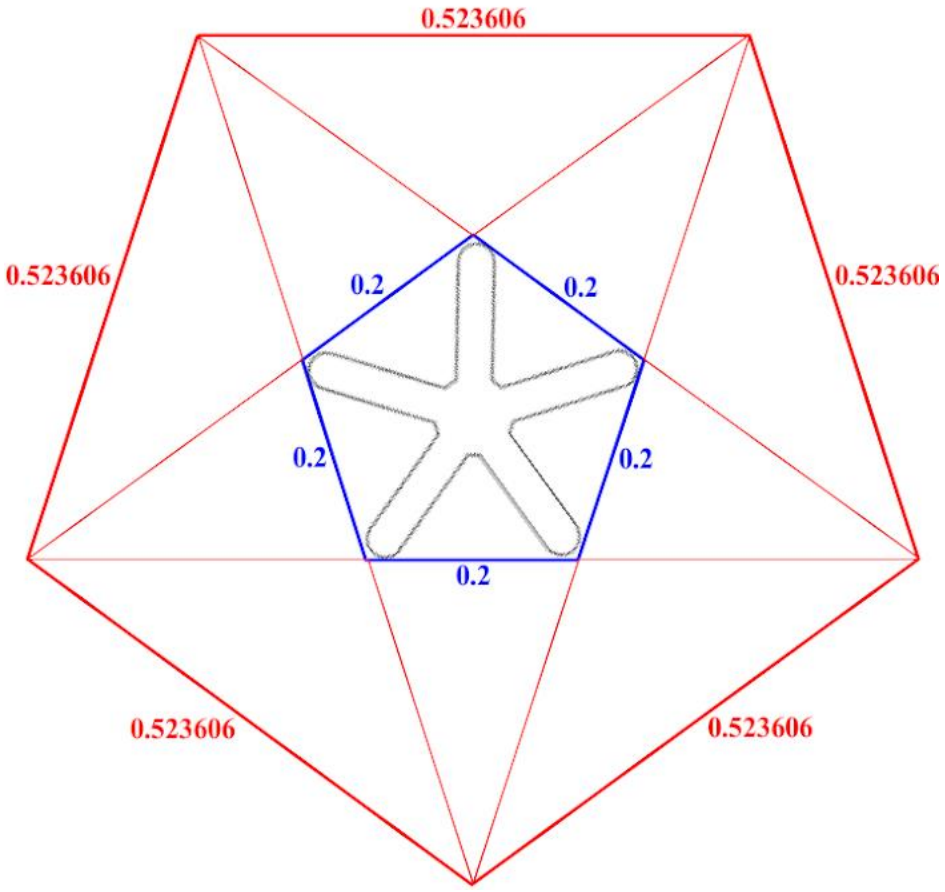


The Meter and the Royal Cubit in Ancient Egypt

A SIMPLE FORMULA FOR LARGE SCALE METROLOGY (LSM)
AND PRECISE ESTIMATION OF PI, IN CONTEXT

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Abstract

This paper presents a hypothesis on the advanced metrological skills of the Ancient Egyptians and/or Britons, evidenced by their precise estimation of the Earth's quadrature with an error margin below 0.005%, as detailed in the "Giza-Stonehenge Connection Paper." Their use of a base-10 system and emphasis on geometric principles led to the division of the Earth's circumference into four parts, each subdivided into 10,000,000 units, prefiguring the metric system's development.

The term "Met-hah-ua," meaning "one of ten-million," is proposed for this ancient unit, correlating with the modern meter. Utilizing the sacred ratio of √5, this measurement was subdivided to establish the Royal Cubit, with the perimeter of a specific triangle divided into segments measuring 0.523606797 meters each. This detail introduces an educational scenario: calculating the height of a triangle with a perimeter of 10 Royal Cubits, revealing it to be 1 Met-hah-ua.

Further analysis reveals Glen Dash's reported Great Pyramid base length as a precise range between 230.35 and 230.40 meters. With the pyramid presumed to be designed at 440 cubits, the Royal Cubit measures between 0.52352 and 0.52363 meters, fitting neatly with the proposed 0.523606 meters and linking to the significant √5.

This hypothesis underscores the Ancient Egyptians' integration of mathematical precision into their spiritual and architectural endeavors, highlighting their deep understanding of geometry and metrology reflected in their monumental constructions.

Introduction

This concise investigation forms the crux of my working hypothesis. It posits that the Ancient Egyptians and/or Britons possessed advanced skills in Large Scale Metrology (LSM), as demonstrated by the precise measurements highlighted in my Giza-Stonehenge Connection Paper. With such capabilities, they were likely able to approximate the Earth's quadrature from the equator to the North Pole with astonishing precision, achieving an error margin of less than 0.005%. Their preference for a base-10 counting system and the geometrical significance of the square and its diagonal—illustrated by the relationship between the Royal Cubit and the Remen—led them to divide the Earth's circumference into four parts (a quadrature), further subdividing each part into 10,000,000 units. Unbeknownst to them, this method of dividing the quadrature into 10,000,000 units would millennia later echo with the French in their efforts towards measurement standardization, ultimately leading to the creation of the meter.

Methahua

In the context of this discussion, let us hypothesize that this ancient unit of measurement, 1/10,000,000th of the Earth's quarter circumference, was called the "Met-hah-ua" (meaning "one of ten-million"). This unit, deemed sacred, corresponded to what we today recognize as 1 meter. In a remarkable fusion of reverence and true GEO-metry, the King and priests utilized the sacred proportion of √5 to subdivide this measure, resulting in the establishment of the Royal Cubit.

The process involved dividing the perimeter of a triangle, with a height of one Met-hah-ua and a base twice that length, into 10 equal segments. Each segment of this perimeter was found to measure 0.523606797 meters, a length now known as the Royal Cubit.

The Formula

From this, an intriguing question emerges that could be posed to an ancient Egyptian student: "If the perimeter of a triangle, with a base-to-height ratio of 2:1, equals 10 Royal Cubits, what then is its height?" The answer: 1 Met-hah-ua.

The formula is elegant and simple:

$$P = \mathrm{a} + \mathrm{b} + \sqrt{a^2 + b^2}$$

Let P denote the perimeter of a right-angled triangle, with a and b representing the lengths of the perpendicular sides.

$$P = 1 + 2 + \sqrt{1^2 + 2^2} = 5.23606$$

$$\frac{5.23606}{10} = 0.523606 = \text{Royal Cubit}$$

The Base Length of the Great Pyramid

In the examination of the Royal Cubit's precise value, analysis of Glen Dash's reported base length of the Great Pyramid at Giza, recorded as 230.40 meters with rounding to the nearest tenth of a meter, is crucial. This reported measurement implies an actual range between 230.35 to 230.44 meters. However, a more refined estimation narrows this to between 230.35 and 230.40 meters for at least two significant reasons:

1) Sir Flinders Petrie's meticulous measurements of the Great Pyramid consistently indicate values below 230.40 meters.
2) Dash himself does not record measurements exceeding 230.40 meters, acknowledging the pyramid's minor deviations from perfect squareness.

Given these observations, it is reasonable to deduce that the true base length of the Great Pyramid resides within a narrow 5-centimeter margin, between 230.35 and 230.40 meters. Working under the premise, as suggested by Petrie, that the pyramid was designed to encompass 440 cubits, the Royal Cubit (RC) employed in the construction of the pyramid would therefore have a length between 0.52352 meters (230.35 / 440) and 0.52363 meters (230.40 / 440). The figure of 0.523606… meters that I propose fits precisely within this range.

This alignment is not merely a matter of precision but also of mathematical and geometric elegance, particularly when connected to the square root of 5 (√5), since:

$$0.52360679 \times 440 = 230.387$$

Geometrical Significance

The significance of √5 in ancient Egyptian architecture and symbolism cannot be underestimated, as evidenced in the dimensions of the King's Chamber, Hemiunu's mastaba, and the emblematic representation of the Duat (figure 1). Moreover, as demonstrated by John Legon, the diagonal stretching from the northeastern corner of the Khufu pyramid to the southwestern corner of the Menkaure pyramid precisely defines the diagonal as the √5 of what I term the "Giza Grid." This and related findings are detailed further in my papers on the Synodic Cycle and the Giza Grid in the context of Ancient Egypt.

More to follow, with further demonstrations of the how the same formula can generate a highly accurate approximation of pi: 0.5236067 x 6 = 3.1416 (Figure 2).

Conclusion

Thus, my hypothesis, open to review and refinement, does not merely present the most precise empirical correlation between the Royal Cubit and the meter on the Giza Plateau; it also employs Occam's Razor effectively in mathematically contextualizing the relationship between the meter and the Royal Cubit. This hypothesis underscores a sophisticated understanding of geometry and metrology among the ancient Egyptians, reminiscent of the mathematical knowledge encapsulated in the Rhind Mathematical Papyrus, and illuminates a sacred geometrical connection woven into the fabric of their monumental architecture, signifying a profound integration of their scientific observations with their spiritual and cultural practices.

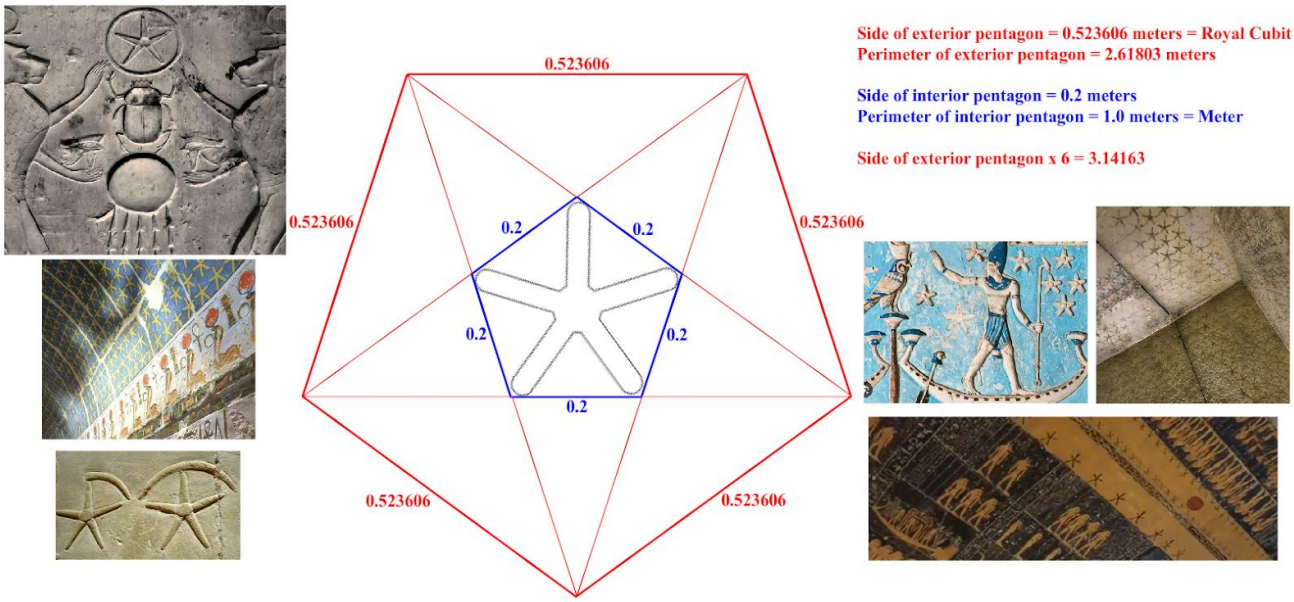
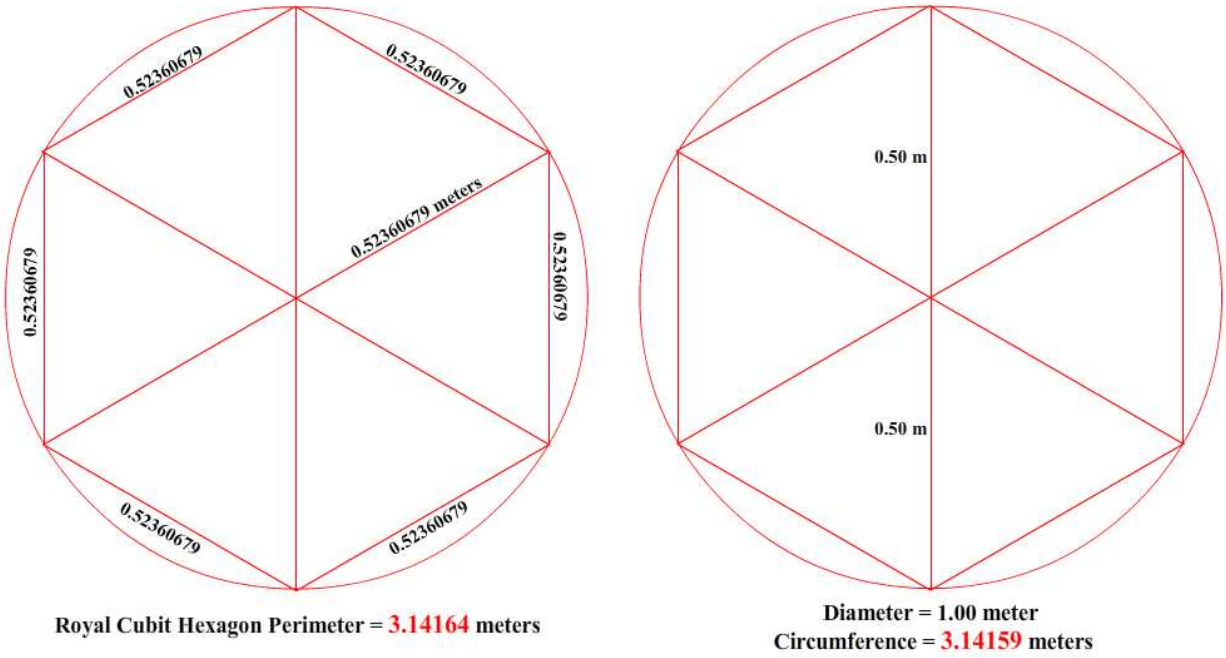


Figure 1

Royal Cubit Hexagon Perimeter as extremely precise approximation of Pi
Percentage error = 0.0015%



Royal Cubit Hexagon Perimeter = 3.14164 meters

Diameter = 1.00 meter
Circumference = 3.14159 meters

Figure 2