The mystery of Giza

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The Great Pyramid of Giza in Cairo in Egypt, also called the Cheops Pyramid, was finished around 2560BC. It was the tallest man-made structure for over 3800 years. A sketch of the pyramid has been drawn and the following measurements are in meters.

If you take half of the perimeter of the Great Pyramid, \(230.25 + 230.36 + 230.39 + 230.45 = 921.45\) and \(921.45/2 = 460.725\), and divide it by its height, the result is very close to \(\pi\), namely, \(\frac{460.725}{146.64} = 3.141878\). Compared to the true value of \(\pi = 3.14159\ldots\) we clearly see that the Egyptians knew at least four digits. We do not know exactly how many they knew due to physical uncertainty.

The Egyptian *Rhind Papyrus* from around 1550 BC\(^1\) states that \(\pi \approx 3.16\) and the first theoretical calculations were carried out by Archimedes (287-212 BC). He obtained the approximation \(\frac{223}{71} < \pi < \frac{22}{7}\) and thus \(\pi \approx 3.14\) the first three digits of \(\pi\).\(^2\) This was over two thousand years after the Pyramids of Giza were built. So it’s a mystery why and how many digits the old Egyptians really knew and why this knowledge is lost.

Picture of Mark at the Pyramid of Giza in April 2018.
References

[1]: http://www.britishmuseum.org/research/collection_online/collection_object_details.aspx?objectId=110036&partId=1

[2]: http://www-groups.dcs.st-and.ac.uk/history/HistTopics/Pi_through_the_ages.html