

Babylonian and Egyptian geometry—a very brief overview

Ancient Babylonian and Egyptian mathematicians seem to have been concerned primarily with arithmetic calculations, and probably didn't regard geometry as a separate branch of mathematics. However, we do have a few extant examples of ancient geometry, mostly calculations of area and volume.

Here is an excerpt¹ from the Rhind Papyrus, an Egyptian mathematical text dated to approximately 1650 BCE:

Example of a round field of diameter 9 khet. What is its area? Take away 1/9 of the diameter, 1; the remainder is 8. Multiply 8 times 8; it makes 64. Therefore it contains 64 setat of land.

Here are some features of this excerpt that are characteristic of ancient Babylonian and Egyptian mathematics:

- It's really pretty accurate. The relationship between area A and radius r is $A = (256/81)r^2$, which is equivalent to approximating $\pi \approx 256/81 = 3.16049\dots$. This is not bad at all, and would be perfectly fine for any applications the Egyptians used it for.
- Mathematics is described verbally instead of symbolically. In modern notation, we can rewrite the relationship between area A and diameter d given in the excerpt as

$$A = (d - d/9)^2 = \frac{64}{81}d^2$$

but the Egyptians lacked the notational tools to do this (to be fair, Western mathematics didn't come up with modern algebraic notation until the 1600s or so).²

- In these cultures, mathematics was concerned with solving applied, practical problems. Rather than talking about the area of a circle, the problem talks about a “round field”. There is little, if any, geometric abstraction in extant Babylonian and Egyptian texts.
- The Babylonian and Egyptian writings tend not to include explanations (much less formal proofs). There's more focus on how to solve a problem (by following an algorithm) than why the given solution works.

For more reading:

- MacTutor: Babylonian mathematics
<http://www-history.mcs.st-andrews.ac.uk/Indexes/Babylonians.html>
- MacTutor: Egyptian mathematics
<http://www-history.mcs.st-andrews.ac.uk/Indexes/Egyptians.html>

¹Taken from Stahl, chapter 2, p. 1

²One wonders what elements of modern mathematics notation will become obsolete in a millennium or two.