Babylonian and Egyptian Math

Mesopotamia

- Most of our evidence from 5000BC comes from Mesopotamia, the area between the Tigris and Euphrates rives in what is now Iraq (1, pg 7)
- They wrote on clay tablets with a wooden stylus produced between 1900 and 1600BC, and many have survived (1, pg 8)
- They used wedge shaped symbols which were later adopted, because they couldn't draw curves on the clay (2, pg 1)
- The period from which many tablets have been recovered is known as the Old Babylonian period, which is why they call it Babylonian mathematics (1, pg 10)
- We have a much more detailed understanding of their math (1, pg 8)
- The activity of the scribes arose from everyday necessities of running a central government (1, pg 10)
- Scribes then became interested in the subject, and extended problems and techniques (1, pg 10)
- Most tablets are either tables to assist computation or collections of problems for training (1, pg 10)
- They used a place value system based on 60, and a 1 and tens symbol denoted the numbers 1 through 59 (1, pg 10)
- They divide the day into 24 hours, each hour into 60 minutes, each minute into 60 seconds (2, pg 2)
- They had extensive tables of products, reciprocals and conversion coefficients, fractions were in sexagesimal format (1, pg 11)
- They have tables that give the squares of the numbers up to 59, and cubes up to 32, which date back to 2000BC (2, pg 2)
- They could solve linear equations, and some quadratic equations (1, pg 11)
- Geometry was devoted to measurement (1, pg 11)
- They used a version of the pythagorean theorem (1, pg 11)
- To make multiplication easier, they use the formulas below so that the table of squares is all that's needed to multiply (2, pg 3)
  \[ ab = \frac{(a+b)^2 - a^2 - b^2}{2} = \frac{(a+b)^2 - (a-b)^2}{4} \]
- To make division easier, they use reciprocals, which they have a table for (2, pg 3)
- They used their tables to solve equations, which showed a remarkable depth of understanding (2, pg 4)
- When solving quadratic equations, they used only the positive root (2, pg 5)
- They have recreational problems, or puzzles (1, pg 11)
- At the end of the Old Babylonian period, scribes began to be trained at home, ending math as its own identity (1, pg 12)
- This math was driven by methods (1, pg 12)
Egypt

- The Egyptians joined under a single ruler by 3000BC, and the country was well suited for civilization (3, pg 1)
- The Great Pyramid at Giza was built around 2650BC (3, pg 1)
- Perhaps in building the golden pyramid they recognized the golden ratio and perhaps pi (3, pg 3)
- The ancient Egyptians wrote with ink on papyryus, which doesn't survive well (1, pg 7)
- Also, most research on the Egyptians was done near temples and tombs, not cities (1, pg 7)
- Scholars are not in agreement about the nature and extent of Egyptian math (1, pg 8)
- The Rhind Papyrus dates back to about 1650BC and contains extensive tables used as computation aids and training problems, probably used for scribes (1, pg 8). It has 87 problems (3, pg 2)
- They also have the Moscow papyrus which is from the same time period as the Rhind. It has 25 problems (3, pg 2)
- The Egyptians use two numeration systems based on powers of 10, one when writing on stone, the other for paper (1, pg 8)
- Their number system was not well suited for arithmetical calculations, but they devised methods of multiplication and division that involved only addition (3, pg 1)
- Their basic arithmetic operations were adding and doubling. To multiply or divide they used a method based on doubling (1, pg 9)
- They didn't work with fractions, on the idea of an $\frac{1}{n}$th part (1, pg 9)
- They could solve simple linear equations (1, pg 9)
- They knew how to compute or approximate areas and volumes of some shapes (1, pg 9)
- Math was recorded and taught by means of problems that were intended as examples to be imitated (1, pg 9)
- They were only concerned with practical arithmetic (3, pg 3)
- The Egyptian calendar was crucial because of the flooding of the Nile (3, pg 3)

1. *Math Through The Ages* by Berlinghoff
2. *An Overview of Babylonian Mathematics*
   [http://www-history.mcs.st-andrews.ac.uk/history/HistTopics/Babylonian_mathematics.html](http://www-history.mcs.st-andrews.ac.uk/history/HistTopics/Babylonian_mathematics.html)
3. *An Overview of Egyptian Mathematics*
   [http://www-history.mcs.st-andrews.uk/history/HistTopics/Egyptian_mathematics.html](http://www-history.mcs.st-andrews.uk/history/HistTopics/Egyptian_mathematics.html)